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ABSTRACT

This annual volume is an annual compilation of articles that address evaluation, treatment, efficacy, and credentialing, and a synopsis of programs that provide speech, language, hearing, and swallowing services. Featured articles include: (1) "Verification of Credentials and Privileging Review" (Kathryn W. Enchelmayer); (2) "The Efficacy of Dysphagia Intervention: A Quality Assurance Perspective" (Joy E. Gaziano and Stacie Ruben Smith); (3) "Balint's Syndrome: A Case Study of the Influence of Non-Language Deficits on Aphasia Test Performance" (Nancy Jeanne Haak and Michael A. Crary); (4) "Oculopharyngeal Muscular Dystrophy: A Case Report" (Paula A. Sullivan and others); (5) "Perception of Handicap by Hearing-Impaired Elderly and Their Significant Others: Effects of Communication Training" (Alice E. Holmes and others); (6) "Cochlear Implants" (Constance L. Cabeza and others); (7) "Post-Stroke Depression and Its Treatment: A Literature Review" (Sarah E. Williams); (8) "Phonatory Facilitation Using the Method of Lombard" (Joseph J. Langhans); (9) "Interdisciplinary Evaluation of Pediatric Feeding and Swallowing Disorders: Perspectives of Speech-Language Pathology in Healthcare" (Pamela Y. Clarke); (10) "The Role of Speech-Language Pathologist in the Comprehensive Epilepsy Center (CEC)" (Lillian Rosenberg); and (11) "Speech-Language Services for Children and Adolescents in Psychiatric Hospitals" (Janet S. Harrison and Susan S. Anderson). (Articles contain references.) (CR)

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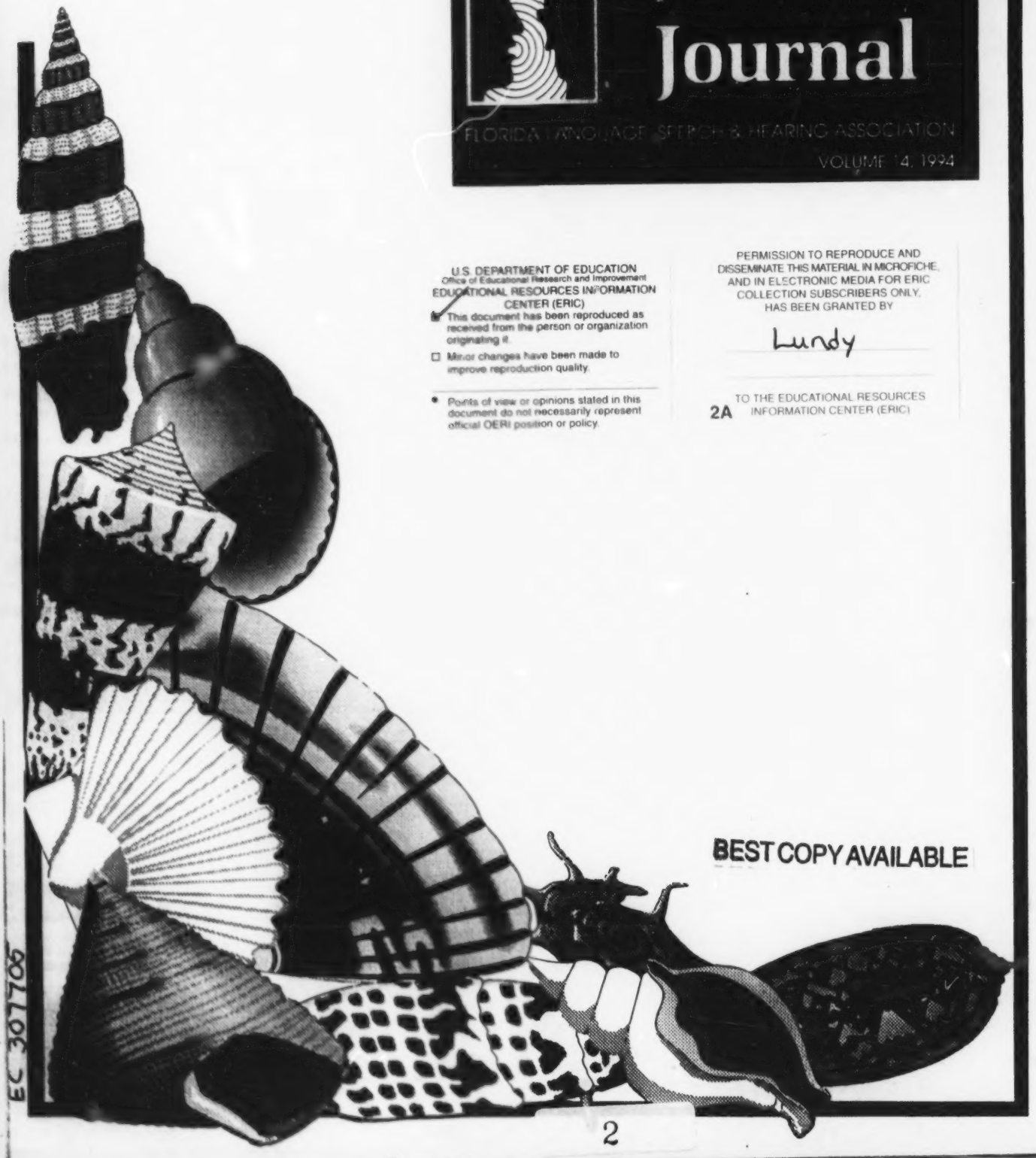
Journal

FLORIDA LANGUAGE, SPEECH & HEARING ASSOCIATION
VOLUME 14, 1994



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FOREWORD

Volume 14 of the Florida Language, Speech and Hearing Association *Journal* is a compilation of articles addressing evaluation, treatment, efficacy, credentialing, and a synopsis of programs providing speech, language, hearing and swallowing services. With health care reform on the horizon and our emphasis on preferred practice parameters for both evaluation and treatment across speech, language, hearing and swallowing, articles such as Kathryn Enchelmayer's credentialing and privileging review and efficacy in dysphagia intervention co-authored by Joy Gaziano and Stacie Ruben Smith are timely. Unique case reports of patients with Balint's syndrome co-authored by Nancy Jeanne Haak and Michael Crary, and oculopharyngeal muscular dystrophy co-authored by Paula Sullivan, Richard Davis, Jr., and H. Worth Boyce, Jr. provide the clinician and researcher alike with front-file information on unique patients who are not so often seen but may well come calling in search of our professional expertise. Alice Holmes, Patricia Krikos and Alina Paz share a clinically important study regarding the effects of communication training on both hearing-impaired persons and their significant others. Technological advancement in cochlear implantation and clinical protocols are highlighted by Constance Cabeza and colleagues. Sarah Williams shares a concise report of post-stroke depression, a clinically and personally relevant phenomenon for those having suffered a CVA. Joseph Langhans provides an historical review, conceptual framework for and use of Lombard's method to facilitate phonation in patients presenting initially with differing etiologies. A program for pediatric feeding and swallowing disorders is authored by Pamela Clarke. Articles highlighting speech-language services in an epilepsy center and in a psychiatric hospital are authored by Lillian Rosenberg and by Janet Harrison and Susan Anderson, respectively. Overall, the clinical relevance and topic coverage of Volume 14 is stimulating, thought provoking, and professionally useful.

It has been both an honor and a privilege to serve as Editor of Volume 14 of the *Journal*. Many thanks are extended to contributors to the *Journal* and members of the Editorial Review Board. I am particularly pleased with and proud of the response by the membership in submitting manuscripts. I hope and believe that contributors to the *Journal* and the membership find the *Journal* relevant, informative, and a publication of which we can be proud. Future contributions are encouraged and welcomed from the membership. I am also especially grateful to those tremendously hard working, helpful and dedicated professionals who comprised the Editorial Review Board. Their efforts were exceptional and my appreciation cannot be overstated.

Contributions to the *Journal* may take the form of clinical and research articles, case studies, review articles, tutorials, clinical reports/methods/programs/technology, and papers addressing professional issues. Submitted manuscripts are peer reviewed by members of the Editorial Review Board. A complete copy of the "Publication Policies" of the Florida Language, Speech and Hearing Association may be obtained from the Association Office. Audiologists and speech-language pathologists are invited to respond to the "Call for Papers" for Volume 15 of the *Journal*. The "call" will be published in the *FLASHA FORUM*.

Joseph J. Langhans
Editor

Verification of Credentials and Privileging Review

Kathryn Whittington Enchelmayer
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Washington, D.C.

ABSTRACT

Credentialing and privileging is a process of verification of education, training, licensure and experience to ensure competency in professional practice. An overview of the credentials review and clinical privileging process used by healthcare organizations is presented.

The cornerstone of any healthcare organization's medical quality assurance program must be the complimentary process of credentialing and privileging. Credentialing is the careful verification of providers' credentials and qualifications and includes verification of professional education, training, licensure, and previous experiences. Privileging is a thorough evaluation of the providers' experiences and proficiencies to perform clinical procedures and assures that skills are commensurate with the needs of the particular diagnostic and therapeutic procedures for which they are responsible. The review of skills should assure that only those health care practitioners who have demonstrated professional competence are delivering the clinical service.

The granting of clinical privileges involves documentation and enumeration of specific clinical privileges to be granted by an institution to a specific professional. The delineation of specific clinical privileges should ensure that the professional performs only those diagnostic or therapeutic procedures for which he/she is considered to be competent as judged by peers.

Recruiters of audiologists and speech-language pathologists have generally assumed applicants who present resumes, transcripts, and letters of recommendation are qualified to perform the activities defined by the job description. Credentialing and privileging have not been seen as a part of total quality improvement or quality management programs. The concept of "the right person receives the appropriate care from a qualified person in a timely and cost efficient manner," has been implemented through quality control, clinical outcome, cost effectiveness and resource utilization. As the complexity of our professional responsibilities and the risk of causing harm to patients increases, the assumption of proficiency must be tested. It is the intention of this report to outline a format for establishing and maintaining a prescribed program of credential review and granting of clinical privileges.

Credentials Review in Audiology and Speech-Language Pathology

A usual recruiting and hiring procedure includes advertising a position, receiving resumes and interviewing. At the time of the initial interview the interviewer verifies the entry level master's degree status via questioning and transcript review and assures professional qualifications, usually American Speech-Language-Hearing Association certification of clinical competence and state licensure. Letters of reference are reviewed and if allowed by the applicant, former employers may be contacted.

Many applicants for health care positions willingly allow the necessary, in-depth, review of credentials required by many institutions. Medical specialties in particular usually submit to pre-employment primary source verification for education, training and all state licenses. Primary source verification is the direct contact, by the perspective employer, usually by form letter or documented telephone call, asking for verification of education and training. In the areas of audiology and speech-language pathology such verification would include education, clinical fellowship year and certificate of clinical competence. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires verification of health status when the statement is made that an individual is physically and mentally capable of providing the services for which he or she is hired. State license verification extends not only to active licenses, but to inactive, surrendered, relinquished or lapsed licenses. The verification of the reason why a person does not have a license may reveal personal as well as professional conduct issues.

Public Law 99-660, Health Care Quality Improvement Act of 1986, required healthcare practitioners licensing status be reported to and available from the National Practitioner Data Bank. While audiologists and speech-language pathologists are presently not included under this law, the implementation of Section 5, Public Law 100-93, Medicare and Medicaid Patient and Program Protection Act of 1987, will require all allied health care providers to participate in the National Practitioner Data Bank and submit to full credential review if they receive federal or federal/state funding.

Clinical Privileges

When clinical privileges are granted by a given institution they enable a practitioner to provide patient care services in that institution with well defined limits that are based upon the individual's professional license, experience, health care status, training, competence, ability, clinical judgement, and available institu-

tional resources. JCAHO standards require reprivileging at a minimum of two year intervals and many institutions choose to reprivilege annually.

Clinical privileges are granted in accordance with the established policy and procedures for an audiology or speech-language pathology program. General criteria for granting of privileges include evidence of current license, relevant training and experience and current competence in specific defined procedures. If the privilege delineation is based primarily on experience the practitioner's credentials record must reflect the site and period of time when the experience was obtained.

A policy and procedures manual defining the purpose, protocol, and procedures that are the responsibility and right of professionals is the basis for granting privileges. A given provider requests privileges only for those procedures that will be performed within the specific setting according to his or her role in that setting. For example, a speech-language pathologist who has education, training, and experience in dysphagia and who is employed in a medical center where he or she will be providing dysphagia services must have privileges specified in that area. Privileges in laryngeal endoscopy should not be requested or granted if the person has inadequate qualifications and will not be performing those services. In addition, a given professional may have a number of privileges at different levels of supervision. For example, a person may be fully independent in dysphagia management but require on site supervision by an appropriately privileged individual for endoscopy. As experience in endoscopy is obtained, privileges at a level of greater independence may be granted.

A clinical provider must apply for clinical privileges in a given facility. For example, in a Department of Veterans Affairs Medical Center Audiology and Speech Pathology Service the professional's request is first reviewed by the supervisor, either the Section Coordinator or Service Chief. The Service Chief will verify the clinical experience and determine the appropriate level of initial privileging based upon the applicant's past experience, training, and clinical competence. Also considered are Peer References which speak to the clinicians skills. The Service Chief then forwards the privileges request to the Medical Center Privileging Committee who reviews and confirms or rejects the request. If confirmed, the privileges are signed by the medical center director and the clinical privileges are in effect.

Clinical privileges are a verification from the Service Chief, supervisor, or Director that an individual is capable of providing the services described. They provide the practitioner with a legal right to perform the services in that facility. Many organizations already have a standardized filing system for credentials review and clinical privileging in place. If not, it is relatively easy to organize such a folder. Current clinical privileges should be in the first section with supporting documentation and verification of credentials in another section. Peer reviews or letters of support from peers and documentation of specific skills, if required, would be in other sections.

Renewal of clinical privileges occurs at predetermined intervals, usually one or two years. During the review the provider and supervisor evaluate professional performance, judgement, and clinical and technical competence and skills. The review should consider the number and kinds of diagnostic and therapeutic procedures performed, new skills developed during the year, and any procedures that have not been employed where the skills may no longer be viable. Peer review and recommendations regarding the provider's skill in clinical areas may be very important.

The process of credentialing and privileging is one of risk management; to assure that care providers are qualified and capable of providing procedures to those patients where such services are required. It is a system of both prevention and augmentation of professional care delivery. We assure our professionals are competent in the areas where they work and develop competencies in areas of need.

REFERENCES

Accreditation Manual for Hospitals, Volume I Standards and Volume 2 Scoring Guidelines for 1991.(1990) Joint Commission on Accreditation of HealthCare Organizations

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Zusman, J. (1990). Credentialing and Privileging Systems. C &D Printing Co.

APPENDIX A

Example of Clinical Privileges. Please note that each practitioner should have privileges specific to their skill levels, abilities, and areas of performance. For each privilege granted the provider and employer should have verification in the form of letter of reference, certificates of continuing education and training, or a mentor program.

Part A

I. Name of Applicant: _____

II. Date of Application for Clinical Privileges: _____

III. Privileges Requested in: _____

Part B Credentials Verification and Review

	initiated	complete
1. Application	_____	_____
2. Reference letters/peer reviews	_____	_____
3. Verification of all previous and current state licenses. A copy of all current state licenses.	_____	_____
_____		
_____		
_____		
4. Verification of education	_____	_____
Graduate School	_____	_____
Clinical Fellowship year	_____	_____
5. Statement of Health	_____	_____

Part C

Clinical Director's Recommendation

_____

Signature

_____

Date

Part D

Administrator Approved/Disapproved

_____

Signature

_____

Date

REQUEST FOR CLINICAL PRIVILEGES AND RESPONSIBILITIES

❑ Initial or ❑ Renewal

Name _____ Date of Application _____

GENERAL - Activities or procedures not specifically listed below which are usually considered to be within the purview of the Service will automatically be extended to you.

SPECIFIED DUTIES AND RESPONSIBILITIES - Activities and procedures that require specifically extended approval before they may be performed by staff members of this Service are listed on the attached pages in tabular form.

CLASSIFICATION OF SPECIFIC DUTIES AND RESPONSIBILITIES - Four categories of clinical privileges may be granted. The category of privileges requested, if any, in each area should be indicated by placing a checkmark for each activity/ procedure. If clinical privileges are not desired for a particular activity or procedure, leave blank.

PLEASE CHECK THE CATEGORY OF PRIVILEGES REQUESTED

REQUESTED	APPROVED	
_____	_____	Category #1: Unrestricted Privileges: Activity or procedure may be conducted under own recognizance.
_____	_____	Category #2: Restricted privileges: activity or procedure may be conducted only following consultation with a staff member designated by the service chief.
_____	_____	Category #3: Restricted privileges: activity or procedures may be conducted only in the presence of a staff member designated by the service chief who hold Category 1 privileges.

SPECIFIC PRIVILEGES

The activities and procedures which require specifically extended approval (privileges) before they may be performed by staff members of this service are listed below.

Indicate the level of Clinical Privileges for which the request is made.

REQUESTED	APPROVED	
_____	_____	Review medical records to assess the presence of variables relating to the cause and/or maintenance of a communication disorder.
_____	_____	Interview clients to obtain complete case history to evaluate causal and/or maintaining factors for the communication disorder.
_____	_____	Evaluate client to determine whether a communication disorder exists, the type of disorder, the causal and/or maintaining factors and the severity.

Specific diagnostic procedures:

REQUESTED	APPROVED	
_____	_____	Screening Audiometry
_____	_____	Motor speech evaluation
_____	_____	Oral motor evaluation
_____	_____	Frenchay Dysarthric Evaluation
_____	_____	Assessment of Intelligibility of Dysarthric speech
_____	_____	Apraxia Battery for Adults
_____	_____	Western Aphasia Battery
_____	_____	Porch Index of Communicative Ability
_____	_____	Communication Activities of Daily Living
_____	_____	Minnesota Test for the Differential Diagnosis of Aphasia
_____	_____	Boston Diagnostic Test
_____	_____	Boston Naming Test
_____	_____	Wechsler Memory Scale
_____	_____	Reading Comprehension Battery
_____	_____	Videonasedoscopy
_____	_____	Videofluoroscopy
_____	_____	Dysphagia Evaluation
_____	_____	Alaryngeal Voice Evaluation Singer-Blom Prosthetic Evaluation
_____	_____	Electolaryngeas Evaluation
_____	_____	Determine if client could benefit from intervention, and structure a treatment program.

SPECIFIC TREATMENT PROCEDURES:

REQUESTED	APPROVED	
_____	_____	Traditional Intervention
_____	_____	Biofeedback
_____	_____	Computer Assisted Treatment
_____	_____	Neuromuscular Retraining
_____	_____	Augmentative Communication
_____	_____	Dysphagia Rehabilitation
_____	_____	Alaryngeal Voice Training
_____	_____	Tension Displacement
_____	_____	Voice Rehabilitation
_____	_____	Write impressions of the type and severity of the disorder, prognosis, and the recommendations on the consultation sheet for the client's medical record.
_____	_____	Make referrals for evaluation of factors related to communication disorders, i.e. Psychology, Neurology, ENT, Psychiatry.
_____	_____	Supervision of student in training and/or other staff seeking clinical privileges for which Category I has already been achieved by supervisor.

I further agree to abide by the highest standards of the ethical conduct and the By-Laws of the Clinical Staff of this Medical Center.

_____ _____

Signature of Applicant Date

Recommendation of Clinic Director

I further certify that the candidate is mentally and physically capable of performing the duties of this position.

_____ _____

Signature of Clinic Director Date

The Efficacy of Dysphagia Intervention - A Quality Assurance Perspective

Joy E. Gaziano
H. Lee Moffitt Cancer Center
Tampa, Florida
Stacie Rubin Smith
South Miami Hospital
Miami, Florida

ABSTRACT

The purpose of this study was to determine the efficacy of a hospital based dysphagia program as demonstrated by functional outcome. Program efficacy was measured by (1) percentage of patients with a swallowing disorder who were accurately identified; (2) percentage of patients in which aspiration was detected, and (3) percentage of patients whose swallowing function improved as a result of intervention: swallowing evaluation or treatment. The importance of efficacy studies in the development of quality assurance and continous quality improvement programs is highlighted.

INTRODUCTION

The efficacy of dysphagia intervention and compilation of quality assurance data have become increasingly important in the provision of health care. The rapidly changing face of health care reform demands that health care programs demonstrate efficacy and cost-effectiveness for services provided. Extensive review of the existing literature on efficacy, outcome, and cost benefit is being conducted within the speech and hearing professions in order to respond to expected changes in the health care system. However, published data are limited despite our longstanding commitment to providing quality care. Quality improvement is not new to speech-language pathologists and audiologists. Improving quality of services has long been an integral part of our service delivery. Efficacy and quality assurance data play a vital role in our professional practice.

Such data as pertains to dysphagia may be compiled in several ways. Delineation of the effectiveness of recommendations made from the results of a specific diagnostic technique such as the modified barium swallow, or the effectiveness of clinical intervention using the Mendelsohn Maneuver or thermal stimulation provide efficacy/quality assurance data (Logemann, 1983; Lazarra, Lazarus, & Logemann, 1986; Horner & Massey, 1988). Examination of the impact of management strategies on morbidity resulting from dysphagia provides such information, as well. Kasprisin, Clumeck, and Nini-Murcia (1989) reported a significant decrease in the occurence of aspiration pneumonia in treated compared to untreated dysphagic patients one year following therapy. Only 6 - 15 percent of treated patients had aspiration pneumonia after treatment compared to 75 - 100 percent of untreated patients. Functional outcome in dysphagia management provides yet another means for examining efficacy. In a study by Hutchins, Kilgore, and Chaudhuri (1990), 74 percent of dysphagic CVA patients were discharged from a rehabilitation hospital at a functional swallowing level. Doran, Casiato and Matsko (1988) reported 71 percent of dysphagic patients demonstrated improvement in functional swallowing. According to Logemann (1990), "In a sense the ultimate test of efficacy of speech-language pathology intervention with swallowing disorders is the number of patients who are managed effectively and the percentage of hospitals that exhibit multidisciplinary dysphagia programs begun by speech-language pathologists."

The purpose of this study was to determine the functional outcome associated with a hospital based dysphagia program. The variables measured include (1) percent of patients with a swallowing disorder who were accurately identified; (2) percent of patients in which aspiration was detected; and (3) percent of patients whose swallowing function improved as a result of intervention: swallowing evaluation or treatment.

Method

Subjects

One hundred and fifty patients referred to Speech-Language Pathology for dyshagia evaluation during the time interval from January to December 1990 were studied. Included were 62 acute inpatients, 21 patients on a rehabilitation unit and 67 outpatients. Subjects ranged in age from 22 years to 98 years with a mean age of 72 years. There were 77 males and 73 females who participated in this study. Time between onset of dysphagic complaints and fluoroscopic evaluation ranged from 3 days to 3 years. Mean time post onset of dysphagic complaints was 2.7 weeks for rehabilitation patients, 4.2 weeks for acute care inpatients and 14.3 weeks for outpatients. All subjects received oral diets before onset of dysphagia. Subjects presented with a range of etiologies (Table 1); severity levels, and cognitive levels.

Procedure

An oral motor evaluation was routinely performed before videofluoroscopic assessment of swallowing. During the videofluoroscopic assessment, a modification of Logemann's procedure was utilized. Each subject was provided with two swallows of 1/3 teaspoon of barium liquid, large multiple swallows of barium liquid, one third teaspoon barium paste and 1/4 of a barium covered cookie. All textures were given unless contraindicated by severity of dysfunction. On occasion assessments were terminated at the discretion of the speech-language pathologist or radiologist if the subject was at risk for significant aspiration.

Data Analysis

Data were analyzed by percentage for

Table 1. Admitting diagnosis for patients referred for videofluoroscopic assessment.

(52)	CVA
(18)	No known etiology
(12)	Dementia
(10)	Pneumonia
(7)	Parkinson's Disease
(6)	Cardiac (intubation)
(5)	Lung Cancer
(4)	Closed head injury
(3)	Vocal Cord Paralysis
(2)	Cuillain Barre
(2)	Respiratory Failure
(2)	Dehydration
(2)	Seizures
(2)	Bone Cancer
(1)	Head/Neck CA
(1)	Brain Tumor
(1)	Hypotensive coma
(1)	Leukemia
(1)	Gunshot wound/head
(1)	Myasthenia gravis
(1)	Benign essential tremor
(1)	Laryngospasm
(1)	Tracheostomy
(1)	Fever
(1)	Bronchitis
(1)	Vertebral malformation

the following 1) presence/absence of dysphagia; 2) presence/absence of aspiration; 3) presence/absence of silent aspiration; 4) effectiveness of compensatory strategies; and, 5) follow-through on dysphagia recommendations. In this study, aspiration was defined as the entry of material into the airway below the level of the vocal folds. Silent aspiration occurred when no cough reflex or attempts to clear the airway were observed during aspiration.

Results

Data on the diagnosis of dysphagia in the sample studied is in Table 2. Of 150 subjects reporting subjective complaints of dysphagia, 80 percent of patients (117) were diagnosed with oropharyngeal dysphagia. The remaining 20 percent (33) presented with normal oral and pharyngeal swallowing function. However, of those 20 percent, 8 percent (12) were identified with esophageal dysfunction resulting in dysphagia, and 12 percent (21) were identified with normal swallowing function.

Table 2. Ocurrence of dysphagia among patients referred for swallowing assessments.

Total patients referred for swallowing evaluation	150
Patients identified with oropharyngeal dysphagia	117/150..(80%)
Patients identified with esophageal dysphagia	12/150....(8%)
Patients identified with normal swallowing	21/150..(12%)

Table 3. Occurrence of aspiration by primary diagnosis.

37%	19/52	CVA	20%	1/5	Lung cancer
11%	2118	No known etiology 100%	4/4		Closed head injury
33%	4/12	Dementia	66%	213	Vocal fold paralysis
20%	2110	Pneumonia	1/1		Head/Neck CA
71%	517	Parkinson's disease	1/1		Brain tumor
50%	3/6	Cardiac (intubation)	1/1		Hypotensiv coma
0%	016	Esophageal etiology	111		Myasthenia gravis

The presence/absence of aspiration and the type, silent or audible, was examined. Table 3 summarizes the occurrence of aspiration by primary diagnosis. Overall, 37% (46/117) of all dysphagic patients aspirated. Of that group, 68% were silent aspirators and 32% were audible aspirators. A range of nutritional options were provided to these patients. NPO status was assigned to 43 percent of aspirating patients. Thirty one percent of those who aspirated maintained oral nutrition with successful completion of compensatory strategies. Fifteen percent of the aspirators were maintained on non-oral nutrition with therapeutic feeding introduced by the speech-language pathologist.

Based on the swallowing assessments for all dysphagic patients, recommendations for nutritional intake indicated the following: Eleven percent of the 117 subjects were put on NPO status; 12 percent had been NPO and remained NPO; 12 percent of patients who had been NPO were taken off NPO status; and 7 percent were recommended to continue NPO status and begin therapeutic feeding treatment by the speech-language pathologist. The majority of patients (60 percent) benefited from compensatory strategies for swallowing (Table 4). Of the 60 percent who were safe oral feeders after intervention, 6.8 percent were considered safe with a change in diet consistency only. An additional 19.7 percent of patients were safe oral feeders with recommended compensatory techniques only. The compensatory techniques included, but were not limited to, positioning, supraglottic swallow, and oral motor exercises. Finally, 33.5 percent of patients were considered safe oral feeders using a combination of diet change and compensatory strategies. These results demonstrate 60 percent (70/117) of all dysphagic patients studied were considered safe oral feeders after intervention.

Table 4. Recommendations for all patients based on dysphagia aesessments

7% - NPO with therapeutic feeding
11% - Placed NPO
12% - Remained NPO
60% - Maintained safe oral nutrition

Finally, physician follow-through of speech-language pathology recommendations was monitored. Ninety-four percent (142/150) of the recommendations were approved by the referring physician. In 6 percent of cases (8/150) speech-language pathology recommendations were not implemented. The most common reason was physician or patient refusal of suggested NPO status.

Discussion

Quality Assurance standards are designed to monitor and evaluate the quality and appropriateness of care provided (JCAHO, 1990). The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards specify that the monitoring and evaluating process be ongoing, comprehensive, result in appropriate actions, and integrated with other departments. Further, recent literature by ASHA (1990, 1993) supports Continuous Quality Improvement (CQI) programs which promote efficient and effective care provided by a coordinated and educated staff. Efficacy indicators must be measurable and result in improved care by everyone involved.

Further research in this area is crucial both to increase our knowledge of disorder, as well as to improve the quality of care provided in clinical settings. Future ideas for research might include the following:

- Identify high risk patients for earlier intervention for dysphagia;
- Identify specific deficits related to

specific diagnoses;
- Identify specific behaviors or markers that denote those patients at high risk who should have a videofluoroscopic study;
- Conduct efficacy studies of particular treatment techniques (eg. electromyography and thermal stimulation);
- Measure functional gains in target populations post-treatment; and
- Monitor nutritional and health status 6 - 12 months post dysphagia recommendations.

Summary

Four main points may be summarized.

1. Eighty-eight percent of patients who were referred were found to have oral or pharyngeal phase dysphagia.

2. Silent aspiration occurred in over two thirds of aspirating patients. Therefore, a comprehensive dysphagia assessment including videofluoroscopy was considered essential.

3. Sixty percent of all dysphagic patients maintained safe oral nutrition with speech-language pathology intervention. An additional 11 percent were placed NPO as a result of speech-language pathology findings, therefore, almost 75 percent of dysphagic patients increased safety of nutritional intake as a direct result of speech-language pathology intervention.

4. Ninety-four percent of speech-language pathology recommendations were followed through by physicians.

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Balint's Syndrome: A Case Study of the Influence of Non-Language Deficits on Aphasia Test Performance

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ABSTRACT

The influence of non-language visual deficits on the performance of language tasks is discussed in this presentation of a single aphasic patient. Evaluation of the patient's aphasia was complicated by the presence of visual apperceptive deficits representing a concomitant Balint's Syndrome. Comparisons across and within subtests of the Western Aphasia Battery (WAB) were used to identify performance deficits related to visual apperceptive problems versus limitations in language comprehension or expression. Suggestions are offered for the identification of such non-language deficits based on WAB performance profiles.

INTRODUCTION

The evaluation of severity and type of aphasia may be complicated by non-linguistic deficits such as hemiparesis, hemisensory loss, visual field defects, dysarthria, apraxia, unilateral inattention and various modality specific agnosias. Occasionally, a patient presents a rather unusual profile on an aphasia test battery in the absence of apparent interfering factors. In this paper we describe a patient who was judged clinically to demonstrate aphasia but whose profile on the Western Aphasia Battery (WAB) (Kertesz, 1979) indicated the presence of additional interfering deficits. Further evaluation revealed a triad of visual apperceptive deficits referred to as "Balint's Syndrome". The purpose of this paper is to describe the visual apperceptive deficits of Balint's Syndrome in this patient and to demonstrate how they altered the patient's performance on a standard aphasia battery, the WAB.

Balint's Syndrome typically, but not always, occurs secondary to bilateral parietal-occipital lesions. It is characterized by three visual analysis deficits: optic ataxia, psychic paralysis of gaze, and visual simultanagnosia.

Optic ataxia is defined as the inability to point to or manually select an object or picture under visual guidance. No difficulty is seen in pointing to locations of sounds or non-visually directed limb movements. The patient with this deficit may misreach for an object and then grope for the location of that object. Conversely, when provided with auditory cues, such as the jingling of keys, the patient would be able to identify them and point to their location immediately.

Psychic paralysis of gaze refers to the inability to voluntarily direct gaze. The patient may complain of not being able to see an item or of seeing only part of an item. At times these complaints are striking such as, "I see part of a female and three quarters of a man standing here." Patients with this deficit are able to perform reflexive extraocular eye movements such as conjugate lateral gaze and convergence tasks without difficulty.

Visual simultanagnosia is the inability to see a complex array. The patient sees only part of the array and fails to grasp the complexity of the entire visual field. The patient with this deficit may report seeing a "leaf" when shown a picture of a tree or a "toothpick", having seen only the bedpost in a picture of a bed. The partial field that is perceived is not stable, with respect to visual field and moves from quadrant to quadrant. This particular aspect of simultanagnosia may cause objects to disappear from sight.

Case Presentation

M.M. was a 79-year-old, right-handed, white female who had suffered a left CVA. A radiology report of the CT scan of the head identified a "cerebral infarction in the left hemisphere adjacent to the third ventricle involving the thalamus and probably the left internal capsule." Initial reports upon admission to the acute care facility note that she was able to respond to spoken stimuli by blinking her eyes and used no other form of communication. She remained hospitalized for one month and was subsequently transferred to a skilled nursing facility.

The patient was evaluated upon admission to the skilled nursing facility. Her history was significant for corrected vision and she wore her glasses during the aphasia examination. Her educational background included a master's degree and university teaching experience. She was oriented to time and person but not to place. Her performance on the Western Aphasia Battery (WAB) was consistent with an anomic aphasia. Her initial WAB profile is presented in Table 1. When asked to describe the picnic scene picture the patient indicated that she could not see it. When pressed, she described a few isolated details but failed to integrate these with other details to yield a coherent story. In contrast, she used complete and complex grammatical structures in a coherent manner when conversation was not tied to visual stimuli. Note that scores for the fluency and information content scales on the WAB were based on conversation and not picture description. During auditory comprehension tasks, she complained frequently that she could not see the objects or pictures presented. Bringing the item closer to her or making pictures larger had no effect on her performance. During administration of the Auditory Word Recognition subtest, she seemed to have much more difficulty recognizing pictured items than non-pictured items such as objects, room furni-

Table 1. Initial performance on the Western Aphasia Battery (9/30/90)

Task	Score	For AQ
I Spontaneous Speech		18.0*
Information Content	9/10	
Fluency	9/10	
II Comprehension		7.65
Yes/No Questions	57/60	
Auditory Word Recognition	26/60	
Sequential Commands	70/80	
III Repetition	100/100	10.0
IV Naming		6.8
Object Naming	47/60	
Word Fluency	3/20	
Sentence Completion	8/10	
Responsive Speech	10/10	
WAB Type = Anomic		AQ=84.9

*Based on conversation not picture description.

ture and body parts (Table 2).

We believe that at least three factors contributed to the discrepancy between the recognition of pictured and non-pictured objects. First, pictures are two dimensional, and, as such require greater visual synthesis to compensate for lack of dimensional and other visual features. Second, pictured items do not allow the use of touch to confirm the identity of an item via tactile cues. Third, the pictures within WAB subtest II, Auditory Word Recognition, include an array of items rather than single item presentation.

On the object naming task, M.M. was able to identify fifteen of the twenty singly presented objects without need for tactile cues. She demonstrated significantly greater difficulty identifying items from the array of six objects placed in front of her on the Auditory Word Recognition subtest even though some of the items were the same as those on the object naming task. This discrepancy suggested a visual simultanagnosia. In addition, when presented with an array of objects, the patient consistently misreached for objects placed on the table in front of her, regardless of their proximity or location in space relative to the midline of her body, behaviors that suggest optic ataxia. In groping for objects, M.M. would usually reach medially and then run her hand along the table until making contact with the object. Movement of pictures or objects to various positions within the visual field revealed impairment of voluntary upgaze and mild restriction of voluntary lateral- and downgaze. There was no deficit in the extraocular muscles on tasks of convergence and conjugate lateral eye movement. The observed deficits in voluntary eye movement were, therefore, attributed to psychic paralysis of gaze.

Table 2. Initial WAB Auditory Word Recognition subtest scores.

Pictured Items	Score
Objects	0/6
Forms	0/6
Letters	0/6
Numbers	0/6
Colors	0/6
Non-Pictured Items	**Score**
Objects	5/6
Furniture	6/6
Body parts	6/6
Fingers	5/6
Right/Left	4/6

M.M. was re-evaluated with the WAB three and a half weeks after her initial evaluation. Table 3 compares the results of the initial evaluation and re-evaluation. The aphasia quotient (AQ) improved from 84.9 to 91.7. This improved score on the WAB was primarily a result of improvement in the Object Naming and Auditory Word Recognition subtests. Since the patient did not demonstrate excessive reliance on tactile cues during administration of the object naming task, we attributed her improved performance on readministration of the task to an improvement of language functions associated with naming rather than resolution of deficits in the visual mode. Conversely, the patient's improved performance on readministration of the Auditory Word Recognition subtest seemed more related to the resolution of visual analysis difficulties than improvement in language comprehension per se. Table 4 presents a comparison of the Auditory Word Recognition subtest on initial and follow-up administrations of the WAB.

Discussion

During the initial evaluation, M.M., demonstrated some discrepancies in her WAB test performance profile that were atypical. Additional clinical investigation revealed the influence of visual apperceptive deficits. There are several observations regarding this patient that may be useful in identifying the influence of visual apperceptive deficits on aphasic test performance.

M.M. revealed a discrepancy in her ability to perform various comprehension tasks. She performed poorly on comprehension tasks requiring a high degree of visual synthesis. Her performance was superior when visual analysis was less demanding, such as on body parts or room furniture or when she was able to use tactile cues in identifying objects from a

Table 3. Comparison of initial and re-evaluation Western Aphasia Battery results for M.M.

Task	Score 9/30/90	Score 10/23/90	Change	For AQ 9/30/90	For AQ 10/23/90	Change
I Spontaneous Speech				18.0	18.0	0
Information Content	9/10	9/10	0			
Fluency	9/10	9/10	0			
II Comprehension				7.65	9.45	+1.80
Yes/No Questions	57/60	57/60	0			
Auditory Word Recog.	26/60	58/60	+32			
Sequential Commands	70/80	74/80	+4			
III Repetition	100/100	100/100	0	10.0	10.0	0
IV Naming				6.8	8.4	+1.6
Object Naming	47/60	58/60	+11			
Word Fluency	3/20	6/20	+3			
Sentence Completion	8/10	10/10	+2			
Responsive Speech	10/10	10/10	0			
WAB Type = Anomic				AQ = 84.9	91.7	+6.8

Table 4. Comparative WAB Auditory Word Recognition subtest for MM.

Pictured Items	Score 9/30/90	10/23/90
Objects	0/6	6/6
Forms	0/6	6/6
Letters	0/6	6/6
Numbers	0/6	6/6
Colors	0/6	6/6
Non-Pictured Items	**Score 9/30/90**	**10/23/90**
Objects	5/6	6/6
Furniture	6/6	6/6
Body parts	6/6	6/6
Fingers	5/6	6/6
Right/Left	4/6	6/6

group.

M.M.'s expressive language was also influenced by the visual demands of the expressive language task. For example, her description of the picnic scene provided sparse, disjointed information, while her conversational speech was coherent and cohesive.

Basic visual deficits such as visual field cuts or visual acuity problems did not appear to be the cause of the visual interpretation difficulties since manipulation of item location, proximity and size had little or no effect on performance. A generalized ataxia did not appear to cause M.M.'s misreaching and groping for items placed before her because non-visually guided limb movements were judged to be appropriate. The examiners did not get the impression that M.M. has visual agnosia per se because she was able to identify and name singly presented objects. Difficulties became more prominent when the patient was presented with pictured items or arrays of items. The lack of more uniform modality disturbance or one where performance decreased as task difficulty increased suggests the need for careful analysis of performance.

MM complained of difficulty in seeing stimuli in the absence of visual acuity deficits or visual field cuts. On the re-evaluation improvement seemed to be primarily in visual and secondarily in language abilities. The improvement in visual ability may have been a true resolution of the visual apperceptive deficit or perhaps an improved ability to compensate for it. Bauer and Rubens (1985) note occasional reports of patients who have been able to develop remarkable compensatory strategies.

The examiners have seen other patients with similar profiles whose aphasia was sufficiently severe to preclude complaint of and/or compensation for visually related deficits. In such cases clinicians must rely on evaluation of test performance to recognize non-linguistic factors which may alter the aphasia profile.

Unrecognized non-linguistic deficits may create misinterpretation of aphasia type and/or severity. When such deficits remain unrecognized, treatment of the aphasic patient may be misdirected. Increased awareness of how such deficits may reveal themselves may lead to more accurate evaluation of these patients and subsequently more effective treatment regimens.

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OCULOPHARYNGEAL MUSCULAR DYSTROPHY: A CASE REPORT

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ABSTRACT

Oculopharyngeal muscular dystrophy (OPMD) is an uncommon disorder characterized by dysphagia and ptosis (drooping eyelids) which occurs after the fourth decade of life. It is inherited as a dominant trait, usually in families of French Canadian descent. Death from this condition can occur from the pulmonary sequelae of chronic aspiration and/or malnutrition. This is a report of a patient with OPMD who presented with the classic signs and symptoms of this disorder.

CASE REPORT

E.D. is a 70 year old male of French-Canadian descent who presented with a 15 year history of slowly progressive dysphagia for solids and recently for liquids. The patient described his dysphagia as there being difficulty initiating a swallow with solids but not pills, and intermittent nasopharyngeal regurgitation of thin liquids, especially water. He also noted a change in his voice with a 'nasal' quality and progressive hoarseness at the end of the day. He had not had a recent weight loss but had modified his diet to softer foods and thicker liquids. He denied a history of heartburn, nausea, or vomiting. However, he did complain of drooping of the eyelids, especially at the end of the day.

Past medical history is significant for a myocardial infarction in 1985, atrial fibrillation, and a cervical spine fusion for degenerative disease.

His family history is significant for a father who died at age 33 years of questionable "amyotrophic lateral sclerosis" and a brother who died 5 years ago from an aspiration pneumonia possibly secondary to OPMD. The patient recalled his brother "... taping his eyelids to his forehead in order to see to drive a car".

Previous medical evaluations included an esophagogastroscopy in 1987 for the removal of a meat bolus impaction in the hypopharynx, just proximal to the cricopharyngeus. No structural abnormalities were noted by the endoscopist. In 1990, a fluoroscopic swallow evaluation using thin and thick liquid barium indicated no mucosal abnormalities;a small amount of aspiration with both consistencies was observed. The endoscope was passed readily through the cricopharyngeus. The esophagus was normal, while the pre-pyloric region of the stomach revealed only mild erythema.

Current evaluation included a history and physical exam, screening laboratory studies, esophageal manometry, and a dynamic video esophagram. Physical examination was pertinent for mild bilateral ptosis, (Fig.1), with normal extraocular movements. Auscultation of the lungs revealed fine bibasilar rales. Other than mild ptosis, examination of cranial nerves II through XII were grossly intact. Proximal muscle strength as well as deep tendon reflexes were normal. Laboratory studies revealed no gross evidence of malnutrition. An esophageal manometric study (Fig. 2) indicated the upper esophageal sphincter (UES) at 18 cm from the incisor teeth. A normal mean pressure of 137 mmHg was obtained. The UES relaxed completely with wet swallows of 5 ml of water. Normal coordination was seen between pharyngeal contractions and UES relaxation. However, pharyngeal contractions were of very low amplitude (4-10 mmHg). Normal peristaltic contractions were observed in the esophageal body. The lower esophageal sphincter had normal pressures and relaxed completely with swallows. These findings were consistent with OPMD.

A dynamic video esophagram was performed with a radiologist and speech

Fig 1. Photo of patient (ED) with evidence of ptosis.

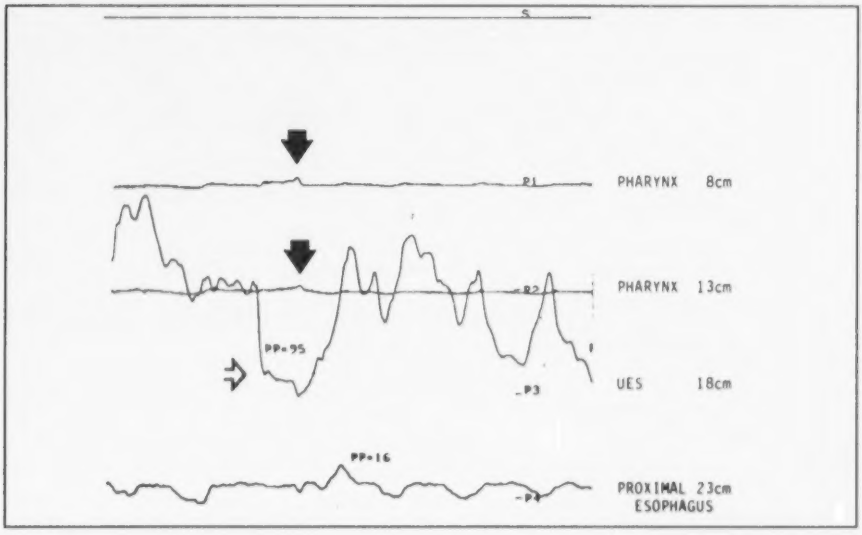

Fig 2. Pharyngo-esophageal manometric tracing. Closed arrows indicate low amplitude pharyngeal contractions. Open arrow indicates UES relaxation. Distance in cm from the incisor teeth is indicated at right. Chart speed = 5 mm/sec; amplitude = 10 mmHg/each verticle square; pp = previous peak pressure.

pathologist present. Liquid barium, barium impregnated pureed substance, and barium coated cookie were presented in the AP and lateral views. Results showed normal oral transit times with all consistencies. Velopharyngeal closure was observed on all swallows. Diffuse coating of the pharyngeal wall was noted after swallows with residual barium in the valleculae and pyriform sinuses (Fig. 3). The epiglottis remained in a static and upright position and allowed aspiration of thin barium during the swallow and afterwards from overflow from the pharyngeal recesses (Figs. 4 and 5). Laryngeal sensation and cough reflex to aspirated barium was diminished. Pharyngeal dysfunction was more pronounced on the left with pureed and solid textures but no aspiration was noted. The cricopharyngeus appeared to open and close normally. Attempts at postural variation to divert liquid away from the airway and reduce pharyngeal residual were not effective. Moderate intermittent hypernasality also was noted during connected speech. The diagnostic impression was one of severe pharyngeal disturbance in a degenerative swallowing and speech disorder.

Treatment recommendations included thickening of all liquids, education regarding the progressive nature of this disorder, and the need to provide safe nutrition by a feeding tube in the future. Screening of other adult family members for this disorder also was recommended.

Fig 3. AP projection demonstrating bilateral residue in the valleculae and pyriform sinuses after the swallow.

DISCUSSION

Oculopharyngeal muscular dystrophy was first described by Taylor in 1915 in a family of French Canadian ancestry with progressive ptosis and "pharyngeal palsy". He attributed the cause of the illness to degeneration of the nuclei of cranial nerves IX and X. It was much later that the defect was seen as a systemic myopathy affecting skeletal muscle groups with a predeliction for the levator palpebrae and pharyngeal muscles. Although first described in French Canadians, this disorder has been reported in other European cultures, e.g. Hungarian, Italian, Irish, and Spanish Americans.

Patients usually present after the fourth decade of life with symptoms of ptosis and dysphagia. A later symptom of proximal muscle weakness of the lower extremities often occurs. Morbidity and mortality are usually related to malnutrition and the pulmonary sequelae of aspiration.

Diagnosis is made from the patient's history and physical exam and the cine or videoesophagram. The differential diagnosis includes other progressive myopathies, such as polymyositis, muscular dystrophy, and myasthenia gravis. Electromyograms and edroponium stimulation testing may help rule out these disorders. The etiology of the myopathy is unknown and there is no known cure. Esophageal manometry has shown low amplitude pharyngeal contractions and either normal or reduced relaxation of the upper esophageal sphincter, while video or cine esophagrams have shown poor pharyngeal contractions with pooling of contrast in the pharyngeal spaces and frequent aspiration.

A multi-disciplinary approach should be taken in the management of these patients. The aims are to provide safe nutrition to the patient, either orally or through a feeding tube, and to prevent the pulmonary sequelae of chronic aspiration, the patient's chief risk. Duranceau et al. (1978) have advocated cricopharyngeal myotomy to facilitate better swallowing and reduce retained secretions. They reported good results in 10/15 patients but did not perform post-operative esophagrams. Also, the follow-up period was relatively short. This surgical treat-

ment remains controversial. Frequent evaluations to assess nutritional needs, pulmonary status, and progression of the disease are vital. Periodic video esophagrams, when indicated, may alert the primary care physician to unsafe oral feedings before aspiration pneumonia occurs. The speech pathologist often plays a pivotal role in the initial diagnostic studies and subsequent exams to assess progression of the disease.

SUMMARY

We report a case of oculopharyngeal muscular dystrophy in a patient of French Canadian descent. The patient presented with progressive symptoms of dysphagia to solids (difficulty initiating swallows); dysphagia to liquids (nasopharyngeal regurgitation); ptosis (drooping eyelids); and nasal speech. Endoscopic examination of the pharynx, esophagus, and stomach were without structural abnormalities. An esophageal manometric study revealed very low amplitude pharyngeal contractions with a normal UES pressure and appropriate relaxation. A dynamic video esophagram showed diffuse pharyngeal involvement with pooling of barium in the pharyngeal spaces, a static epiglottis, and aspiration of thin barium. Recommendations were made to eliminate thin liquids and encourage soft solids and thick liquids in his diet, and to monitor for weight loss and the sequelae of aspiration. The patient is the second and perhaps third immediate family member with OPMD. Screening of family members was recommended. This patient represents a classic case of oculopharyngeal muscular dystrophy which should be considered in the differential diagnosis of pharyngeal dysmotility.

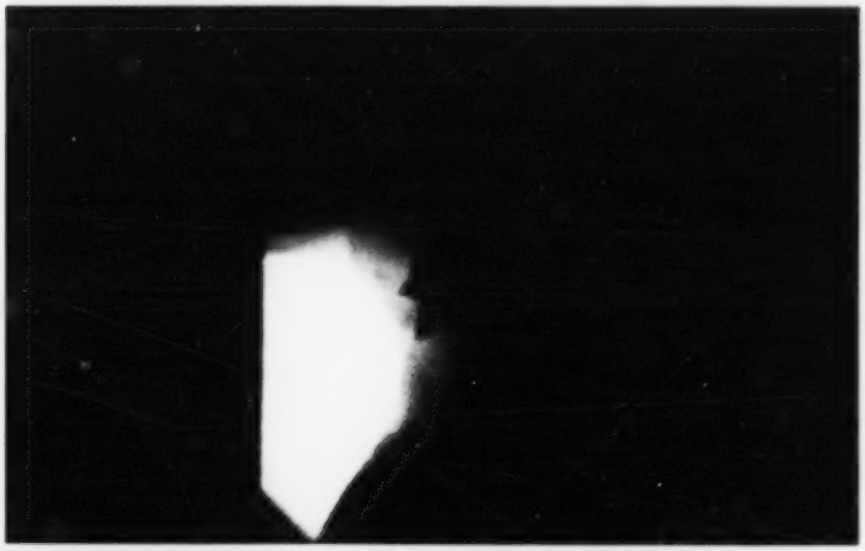

Fig 4. Lateral view showing laryngeal penetration after the swallow.

Fig 5. Lateral view showing aspiration of residual after the swallow.

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Perception of Handicap by Hearing-Impaired Elderly and Their Significant Others: Effects of Communication Training

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Abstract

The perceptions of hearing handicap by 26 hearing-impaired elderly (HIPs) and their significant others (SOPs) were compared before and after an audiologic rehabilitation program. The Hearing Handicap Inventory for the Elderly (HHIE) was used to assess total, emotional, and social handicap perception. Thirteen of the hearing-impaired subjects (experimental group) participated in a communication training program, and 13 served as controls who received no training. Correlation analysis showed that the degree of agreement between SOPs and HIPs improved from the first to the second HHIE administration for both groups. However, there was more fluctuation in handicap perception from the first to the second HHIE administration in the experimental group (HIPs and SOPs), suggesting a treatment effect.

INTRODUCTION

Assessment scales measuring self-perceived hearing handicaps are gaining recognition as instruments for quantifying the effects of hearing loss. Hearing tests alone do not provide complete information about an individuals's hearing problem. Hearing tests quantify sensitivity to sound, but fail to quantify the effects of the hearing impairment on a person's everyday function (Ventry & Weinstein, 1982). A number of self-assessment scales have been developed to help quantify an individual's reactions to hearing impairment, such reactions may be: Does a hearing loss cause him/her to be depressed? Does a hearing loss cause him/her to become withdrawn? Is he/she active despite the hearing loss?

Few studies have been reported comparing the perceptions of hearing handicap by significant others with the perceptions by hearing-impaired elderly. Considering the social and emotional handicaps that may accompany a hearing loss, and the importance of significant others in the adjustment of hearing-impaired individuals, it is surprising that more research has not been conducted to examine the perceptions of significant others. A spouse is usually involved in the audiologic rehabilitation process as a provider of support and guidance to the handicapped individual and to aid carry over of information learned during rehabilitation (Litwack, Litwack, & Ballow, 1980). The family member can help carry over information regarding the use and maintenance of the hearing aid. Demorest and Erdman (1989) report that the psychological environment created by attitudes and behaviors of others may influence the hearing-impaired person's degree of handicap. The level of stress experienced by the hearing-impaired person is often determined by a family member. The difference between an understanding, supportive, and cooperative family and a hostile, complaining, and uncooperative one is reflected in the level of stress experienced by the hearing-impaired person.

Newman and Weinstein (1986) compared 30 hearing-impaired elderly men and their spouses, using the Hearing Handicap Inventory for the Elderly (HHIE; Ventry & Weinstein, 1982) to measure degree of perceived handicap. Results showed that the emotional and social effects of hearing impairment perceived by the hearing-impaired men were underestimated by their spouses. That is, the hearing-impaired men judged their hearing loss to be more handicapping than did their spouses. Correlation analysis indicated a weaker relationship between responses on the HHIE and Hearing Handicap Inventory for the Elderly-Spouse (HHIE-SP) for the emotional sub-scale of the test compared to the social situational sub-scale. (Newman & Weinstein, 1986) The authors suggested that social problems encountered by a hearing-impaired person are probably more observable and, therefore, more easily identified by the spouse. Results also suggested that spouses may not be able to understand the total impact of hearing loss on the hearing-impaired person's emotional well-being.

Anderson, Dancer, and Durand (1990) compared the reports of hearing handicap by a group of hearing-impaired adults over the age of 50 (n=95) to the assessment of their handicap by associates using the Hearing Handicap Scale (HHS; High, Fairbacks & Gloria, 1964). Results of their study indicated no significant differences in perceived hearing handicap between a hearing impaired group and their associates. Chmiel and Jerger (1993) compared patients' and spouses' HHIE responses, and found that patients generally tended to perceive less handicap than was reported by their spouses.

Using the HHIE, Abrams, Hnath-Chisolm, Guerreiro, and Ritterman (1992) demonstrated a significant reduction in degree of perceived handicap in a group of patients who had received hearing aids and a three-week counseling-based program of audiologic rehabilitation. To date the influence of audiologic rehabilitation on perceptions of hearing handicap in the hearing-impaired elderly and their significant others has not been investigated.

The purpose of the present study was to compare the perceptions of hearing handicap between hearing-impaired elderly individuals and their significant others, before and after a program of audiologic rehabilitation. The HHIE (Ventry & Weinstein, 1982) was chosen as the measure of handicap perception because its psychometric adequacy has

been well documented (Weinstein, Spitzer, & Ventry, 1986).

MATERIALS AND METHODS

Subjects

Subjects for this study included 26 hearing-impaired elderly (17 males, 9 females) and their significant others (21 spouses, 3 daughters, and 2 granddaughters). The experimental group consisted of thirteen of the hearing-impaired subjects, randomly assigned to a four week audiologic rehabilitation program which focused on listening training and the use of communication strategies. The remaining thirteen subjects did not undergo audiological rehabilitation and, therefore, were the control subjects. The mean three frequency pure-tone average (500, 1000, 2000 Hz) of the better ear was 33.8 dB HL with a range of 6 to 58 dB HL, and 39.4 dB HL with a range of 21 to 58 dB HL for the experimental and control groups, respectively. The mean high frequency pure-tone average (1000, 2000, 4000 Hz) of the better ear was 45.5 dB HL with a range of 18 to 65 dB HL and 52.4 dB HL with a range of 30 to 68 dB HL for the experimental and control groups, respectively. All subjects had between six months and three years of hearing aid experience.

Materials

The Hearing Handicap Inventory for the Elderly (HHIE) by Ventry and Weinstein (1982) was used to assess the perceived hearing handicap. The HHIE is a standardized scale with excellent internal consistency and high test-retest reliability (Weinstein et al., 1986). It measures the perceived social/situational and emotional effects of a hearing impairment experienced by older adults. The HHIE is a 25 item self-assessment inventory composed of a 13 item emotional subscale and a 12 item social/situational subscale. A version of the HHIE, called the HHIE-SP (Hearing Handicap Inventory of the Elderly-Spouse) was developed for use by the significant other. This modification was identical to the HHIE except for the substitution of "he or she" for "you" in each question. According to Ventry and Weinstein (1982), this modification could be made to assess the significant other's perception of the hearing handicap.

Procedures

Before the audiological evaluation, the hearing-impaired subject was handed the HHIE to be filled out individually. At this time subjects were asked to give the HHIE-SP to their significant others to fill out. The clinician explained to the subject that the HHIE-SP must be filled out by someone who they feel is significant in their lives and is in frequent contact with him/her on a daily basis. The clinician also explained the importance of telling the significant other to fill out the questionnaire (HHIE-SP) independently from the subject (hearing-impaired elderly) in order to avoid any collaboration or bias. The HHIE-SP had a self-addressed stamped envelope attached to it along with a personal letter asking the significant other to please fill out the questionnaire as soon as possible and mail it in to the university speech and hearing clinic. All twenty-six hearing-impaired subjects then underwent a complete audiologic evaluation.

The control group received no training and the experimental group received communication training on an individual basis for four weeks, twice a week, in one-hour sessions for a total of eight sessions/hours. Training consisted of information presentation and listening activities, in quiet and noise, that were developed to train recognition of the meaning of the message rather than individual sounds or words. Coping strategies were emphasized to enable the elderly person with hearing impairment to comprehend the meaning of a message when only part of the signal is heard. Training to develop good listening habits and conversational strategies was designed to increase the subjects' confidence and help them concentrate on the meaning of the message. The areas covered in training were: a) attitude, b) assertiveness, c) repair strategies, d) anticipation strategies, e) relaxation strategies, and f) practice listening

TABLE 1. PRE- AND POST-SCORES FOR TOTAL, EMOTIONAL AND SOCIAL SCALES BETWEEN HEARING-IMPAIRED PERSONS (HIPs) AND THEIR SIGNIFICANT OTHER PERSONS (SOPs).

	EXPERIMENTAL-PRE		EXPERIMENTAL-POST	
	HHIE HIP=13	HHIE-SP SOP=13	HHIE HIP=13	HHIE-SP SOP=13
TOTAL				
MEAN	36.9	33.8	27.7	29.4
SD	20.9	19.7	16.2	20.9
RANGE	16-92	6-68	2-58	8-74
EMOTIONAL				
MEAN	17.7	16.0	11.8	14.0
SD	11.9	10.7	8.3	11.0
RANGE	0-48	2-34	2-24	2-38
SOCIAL				
MEAN	19.2	17.8	15.8	15.4
SD	9.6	9.5	9.3	10.3
RANGE	6-44	4-36	0-34	2-36
	CONTROL-PRE		CONTROL-POST	
	HHIE HIP=13	HHIE-SOP SOP=13	HHIE HIP=13	HHIE-SOP SOP=13
TOTAL				
MEAN	39.8	35.2	31.8	35.1
SD	24.8	19.7	25.9	19.8
RANGE	4-100	8-64	4-100	10-68
EMOTIONAL				
MEAN	20.1	15.7	15.7	15.8
SD	14.1	10.8	14.0	10.5
RANGE	0-52	2-30	4-52	2-34
SOCIAL				
MEAN	19.2	19.5	16.2	19.2
SD	12.4	9.8	13.0	10.5
RANGE	0-48	6-36	0-48	4-36

in background noise. The SOPs did not participate in the treatment program.

Audiometric post-testing was completed approximately six weeks after the original audiometric pre-testing for both the control and experimental subjects. Audiometric post-testing results remained unchanged from pre-testing results. At that time the HHIE and HHIE-SP forms were given to subjects to be filled out a second time.

Results

Mean total, emotional, and social scores for the HHIE and HHIE-SP obtained in the pre- and post-conditions are summarized in Table 1 for experimental and control groups, respectively.

An analysis of variance with repeated measures was conducted for the total scores (emotional and social items combined) to determine if differences in means between Hearing Impaired Persons (HIPs) and Significant Other Persons (SOPs) were significant. The statistical design was two treatment groups (experimental vs. control) in two measures of hearing handicap (HHIE; HHIE-SP) by time (pre-; post-treatment conditions). It should be noted that each couple (HIP and SOP) were treated as a unit in the statistical analysis. A significant main effect between groups was found with the control group perceiving significantly more handicap than the experimental group ($F = 4.37$, $p<.05$). No significant differences were found between HHIE and HHIE-SP (measures) for total scores. A significant interaction of time ($F=5.24$, $P<.05$) by measures was found.

A post-hoc analysis using the Bonferroni procedure (Dunn, 1961) was done to determine the significant differences between the means of the time by measure interaction. These means are found in Figure 1. A significant difference ($p<.05$) was found in the HIPs' perceptions of handicap from pre- to post-treatment conditions, but not in the SOPs' perceptions (HHIE-SP) from pre- to post-treatment conditions. The HIPs perceived a significantly higher handicap ($p<.05$) in the pre- versus the post-treatment condition.

TABLE 2. PEARSON PRODUCT-MOMENT CORRELATIONS BETWEEN HIPs AND SOPs IN THE PRE- AND POST-TREATMENT CONDITIONS.

	EXPERIMENTAL-PRE HIP/SOP	EXPERIMENTAL-POST HIP/SOP
TOTAL	r = .40 p = .173	r = .75 P = .003*
EMOTIONAL	r = .28 p = .358	r = .64 p = .019*
SOCIAL	r = .46 p = .110	r = .75 p = .003*
	CONTROL-PRE HIP/SOP	**CONTROL-POST HIP/SOP**
TOTAL	r = .63 p = .022*	r = .79 P = .001*
EMOTIONAL	r = .55 p = .051	r = .72 p = .006*
SOCIAL	r = .65 p = .016*	r = .81 p = .0007*

r = correlation coefficient * $p < .025$

No significant differences ($p>.05$) were found between the HIP and SOP scores in either the pre- or post-conditions. Pearson product-moment correlations were calculated for pre- and post-treatment conditions to determine the degree of relationship between responses given by HIPs and SOPs. Results of these correlations for experimental and control groups are found in Table 2.

In the pre-treatment condition, no significant correlations were found between HIPs and SOPs in the experimental group for any of the scales (total, emotional, and social). In the control group, however, significant correlations ($p<.025$) were found in the pre-treatment condition between HIPs and SOPs for total and social scales, but not for the emotional scale. All correlations were significant ($p<.025$) for the post-treatment conditions across both the experimental and control groups.

Figure 1. Plot of time by person means collapsed across experimental groups.

DISCUSSION AND CONCLUSIONS

Although it appeared that experimental and control hearing-impaired subjects were perceiving more handicap in the pre-treatment condition and less handicap in the post-treatment condition as compared to their significant others, statistical results indicated otherwise. Perceptions of degree of hearing handicap between all 26 hearing-impaired subjects (control and experimental groups combined) and their significant others were not significantly different from each other in the pre- and

post-treatment conditions for total scales. These results are in agreement with Anderson et al. (1990), who found that perceptions of hearing handicap by older adults were not significantly different from the perceptions of their close associates. The fact that no significant differences were found in perceptions of hearing handicap between the HIPs and SOPs is encouraging. Both HIPs and SOPs were perceiving approximately the same degree of hearing handicap; HIPs were not underestimating or overestimating their handicap compared to their SOPs.

Results revealed there was a significant time by measure interaction. A significant decrease in perception of handicap (total scales) occurred in the HIPs (experimental and controls combined) from pre- to post-treatment conditions. This significant decrease in handicap perception from pre- to post-treatment conditions did not occur in the SOPs. The fact that experimental and control HIPs' perceptions of hearing handicap decreased from pre- to post-treatment conditions is interesting because control subjects did not undergo treatment. This could be interpreted to mean either that treatment was not effective or that the HHIE was not sensitive to changes in perceived handicap as a result of treatment. The HHIE may be more useful for documenting the effectiveness of counseling-based group-therapy programs with new hearing aid users, as shown by Abrams et al. (1992). Correlation analysis (Table 3) revealed that experimental and control HIPs' and SOPs' HHIE scores were in closer agreement for all scales in the post-condition than in the pre-treatment condition. Thus, in the post-scores if the HIP was perceiving a high handicap, the SOP was also perceiving a high handicap; if the HIP was perceiving very little handicap, the SOP was also perceiving very little handicap.

In the pre-treatment condition, however, perceptions between the 13 experimental HIPs and their SOPs were not significantly correlated for any of the scales (total, emotional, and social). Apparently, then, experimental HIPs and SOPs were not in agreement in the beginning of the study. Perceptions between control HIPs and their SOPs in the pre-treatment condition were not significantly correlated for the emotional subscale, but they were significantly correlated for the total and social scales. For this particular group then, the HIPs and SOPs were not agreeing on the emotional aspect of the handicap. This finding was similar to Newman and Weinstein's (1986) finding of a weak correlation for the emotional scale compared to the total and social scales between hearing-impaired subjects and their spouses. Newman and Weinstein (1986) postulated that social problems encountered by a hearing-impaired person may be more observable and therefore more easily identified by the spouse than are the emotional problems. They added that areas probed on the social scale of the HHIE (e.g. "Does a hearing problem cause you difficulty when listening to TV or radio?") may be recalled more easily than areas comprising the emotional scale (e.g. "Does a hearing problem cause you to feel left out when you are with a group of people?").

It is tempting to attribute the significant correlation in the post-treatment condition for the experimental HIPs and SOPs to treatment effectiveness. However, the same correlation occurred for the control HIPs and SOPs in the post-treatment condition. The statistically significant correlations between experimental/control HIPs and SOPs post-treatment may have been due to the fact that HIPs and SOPs discussed specific items on the questionnaire after filling them out for the first time. The questionnaire may have encouraged them to talk with each other about the handicapping effects of the hearing loss. Another explanation might be that the SOPs increased their observation skills over a few weeks time and thus became more aware of the HIPs' handicap. When given the chance to fill out the questionnaire the second time, they may have realized, "No, John does not like to take part in a conversation when there is a group of people around" or "Yes, John gets frustrated when he cannot hear".

Overall findings of this study indicate that some type of positive benefit can be obtained by having the HIP and SOP fill out the HHIE before undergoing treatment or during an initial hearing evaluation visit. The fact that most scores between HIPs and SOPs in the experimental group were not correlated in the beginning (pre-treatment condition) and then after treatment or after a few weeks time (post-treatment condition) responses were correlated, suggests that some type of positive effect was taking place. A self-treatment effect could be occurring in which HIPs and SOPs start discussing the different items on the questionnaire and become more observant and therefore more understanding in terms of perceived handicap. Perhaps this is another reason why audiologists need to administer handicap perception questionnaires to both HIPs and SOPs. Simply filling out a handicap questionnaire may encourage the HIPs and SOPs to start talking with each other regarding the effects of hearing loss. A major consideration, then, should be to request that the HIP come in with his/her SOP to the initial evaluation visit. One focus of audiologic rehabilitation should be helping the SOP become more aware of the negative consequences of hearing loss, which might be partially accomplished through the use of a questionnaire.

None of the HIPs in the present study could be considered new hearing aid users. The subjects had between six months and three years of hearing aid experience and the correlation between length of hearing aid use and HIP-SOP perceptions was not addressed. This might be a fruitful area for research, given that Newman and Weinstein (1988), using the HHIE, found a consistent pattern of change in hearing aid benefit perceived by HIPs during the first year of hearing aid use.

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Cochlear Implants

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ABSTRACT

Chochlear implantation has advanced technologically over the past three decades. In this article is presented a cochlear implant program. The role of the cochlear implant team, pre-implant evaluation, assessment protocols, surgical procedure, and post-operative management are reviewed. Case reports are provided which highlight the success of the program.

Cochlear implants offer hope to profoundly deaf individuals for some degree of usable hearing when they cannot benefit from hearing aids. Instead of amplifying sound as a hearing aid, a cochlear implant converts sound energy to electrical energy and transmits that energy directly to the cochlea. While individuals with sensorineural hearing loss have damaged or destroyed inner ear hair cells and nerve fibers, in most cases there are auditory nerve fibers remaining that can be stimulated. A cochlear implant bypasses damaged hair cells and directly stimulates the remaining nerve fibers which send signals to the brain. A cochlear implant recipient learns how to interpret the electrical stimulation as environmental sounds or, through training in speech reading, as phonemes.

Cochlear Implants — Form and Function

In contrast to a hearing aid which transmits amplified sounds through the ear canal, middle ear, and cochlea and hence to the auditory nerve, a cochlear implant (CI) provides direct electrical stimulation to the cochlear nerve. A cochlear implant consists of a tiny microphone, a signal processor the size of a body hearing aid, an external transmitter, and a receiver, which is implanted. An ear level microphone picks up sound which is electrically transmitted to an external signal processor. The signal processor is in fact, a miniature computer and is worn on a belt, or carried in a pocket or halter. It is programmed to convert incoming acoustic signals into digital codes which are transmitted through a cord to the external transmitter worn behind the ear. Magnets in the external transmitter hold it in place against the skin lateral to the internal receiver which is implanted in the mastoid bone. The digitized sound message is then converted into electromagnetic radio frequency carrier waves which transport the signal through the skin. Figure 1 is a representation of the CI components and description of the functional dynamics.

The dime sized internal receiver reconverts the carrier wave signal into an electrical signal and divides it into 22 channels. Each channel transmits information through a thin platinum electrode surgically inserted into the scala tympani of the cochlea through an opening made in the round window. The electrodes substitute for damaged sensory cells, directly stimulating the auditory nerve which relays the signals to the brain where they are interpreted as sound. (Figure 2).

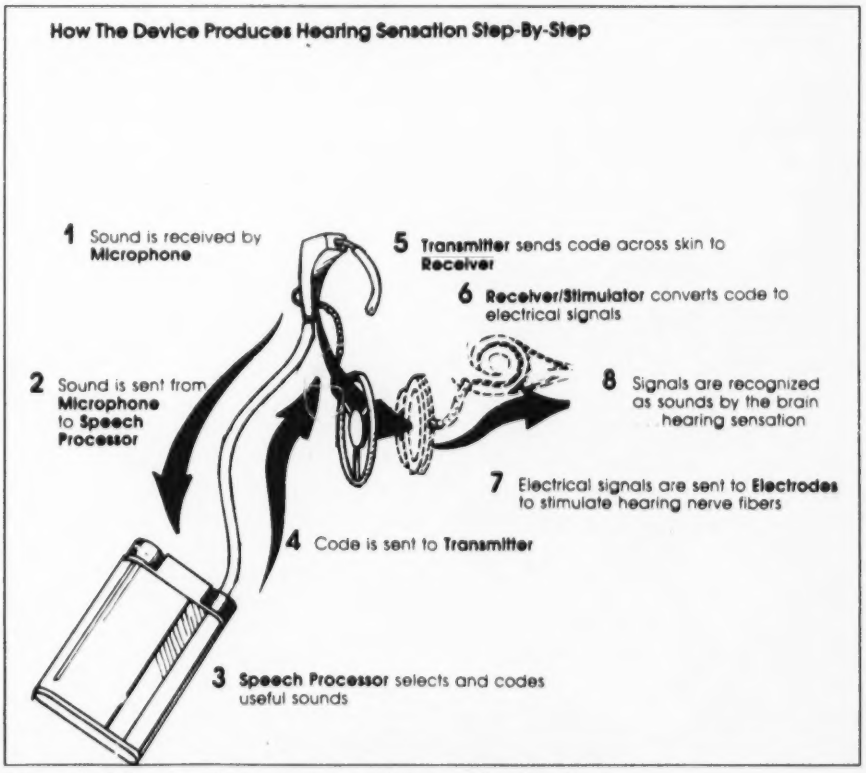
How The Device Produces Hearing Sensation Step-By-Step
1 Sound is received by Microphone
2 Sound is sent from Microphone to Speech Processor
3 Speech Processor selects and codes useful sounds
4 Code is sent to Transmitter
5 Transmitter sends code across skin to Receiver
6 Receiver/Stimulator converts code to electrical signals
7 Electrical signals are sent to Electrodes to stimulate hearing nerve fibers
8 Signals are recognized as sounds by the brain ... hearing sensation

Figure 1. A functional representation of the cochlear implant.

Figure 2. A 22 Channel electrode implanted into the cochlea through an opening in the round window.

Most centers use the FDA 22 Channel

While the Miami Ear Institute at Mercy Hospital uses the Cochlear 22 Channel System, there are several implant systems available. Systems vary in the number of channels and electrodes and pitch discrimination is usually better with more electrodes. Patients implanted with the Cochlear 22 Channel system usually can detect environmental sounds and have the ability to recognize some speech with lipreading. Some users are able to recognize speech without lipreading and fifty percent of the user respondents to a Cochlear Corporation survey reported that they can converse on the telephone especially when voices are familiar (Beiter, Brimacombe & Baker, 1987).

History of Cochlear Implant

Cochlear implant research began in France over thirty years ago. In the United States in 1961, Dr. William House, an otologist, and Jack Urban, an engineer, designed a single channel cochlear implant that was the most commonly used until development of the multiple channel implant. Microcomputer circuit chips enabled development of the Nucleus 22 Channel Cochlear Implant System, Cochlear Corporation, which received Food and Drug Administration approval in 1985 for use with profoundly deaf adults.

Because cochlear implants are designated as a medical device, the Food and Drug Administration (FDA) prescribes criteria which must be met before a person can be considered a candidate for implantation.

Criteria for adult candidates are:

- was at one time able to hear
- is profoundly deaf in both ears
- cannot be helped by hearing aids
- have no other serious medical problems
- have a supportive family
- have sufficient motivation, resilience, and perseverance to go through a lengthy rehabilitation program.

The FDA criteria for pediatric candidates are:

- is age two or older
- has profound sensorineural hearing loss in both ears
- receives little or no benefit from hearing aids or vibrotactile devices
- has no medical contraindications
- is enrolled in an educa-tional program that emphasizes development of auditory skills
- has high motivation and appropriate expectations

To date, over 2,000 adults and 700 children in the United States, Canada and South America have been implanted with the twenty two channel CI. The Nucleus 22 Channel Cochlear Implant is the only FDA approved device.

Cochlear Implants and Deaf Children

In June of 1990, the FDA approved general use of the Cochlear 22 Electrode Implant System for profoundly deaf children over two years of age. Fewer issues in the field of otolaryngology have brought greater controversy than the implantation of this age group.

The FDA guidelines require a child to be at least 2 years of age for consideration of an implant. The age was chosen because even though the cochlea is of adult size at birth it is not until age two that the mastoid antrum and facial recess are developed enough to allow sufficient space for safe electrode positioning inside the cochlea. Of critical importance for a child at this early age is assurance that the child is profoundly deaf and unable to benefit from a hearing aid. Necessary evaluation procedures can take up to six months (Miyamoto, Myres, Carotta, McConkey, Pope, Dunch & Steck, 1987).

In addition to documentation of profound hearing loss, psychological evaluation must show no evidence of organic brain damage, psychosis, mental retardation or behavioral personality traits that would interfere with the necessary rehabilitation program (Tiber, 1987). Other requirements include complete support in the home and an educational setting where the auditory benefits of implantation will be maximized (Berliner & Eisenberg, 1985).

A special concern of hearing professionals is whether implantation of the current generation of implants will preclude a child from benefiting from improved models in the future. In addition, there has been speculation that the stimulation from the implant might encourage excessive bone growth in the cochlea (Webb, Clark, Shepherd, Burkhard & Dyman, 1988). However, the long term monitoring of the adult implant program has revealed no adverse effect of this kind.

Before the professionals at the Miami Ear Institute offered an implantation program, the otologist and audiologist attended a workshop sponsored by the Cochlear Corporation. Here, procedures were explained and the audiologist was provided the materials and test battery for standardized assessment and program planning. The Pediatric Programming Kit, developed by the Cochlear Corporation was purchased. This kit includes all pre and post implant test material and assessment and rehabilitation audio tape recordings to assure standardized procedures. There are separate workshops for children and adults. Information obtained is disseminated to members of the implant team in various facilities.

Cochlear Implant Team

The Cochlear Corporation recommends that the pediatric cochlear implant team include a surgeon, audiologist, speech-language pathologist, educator of the hearing impaired, child psychologist, and parent. Most implant teams have a coordinator who arranges appointments, schedules team meetings, provides inservice meetings at school and makes other school visits. The surgeon and audiologist are the key professionals on the team and make the initial determination of candidacy. Their specific roles are discussed in some detail later. The psychologist provides the team with information regarding intellectual and motivational factors, and the teacher provides optimal classroom seating and assists with equip-

ment troubleshooting while the child is in the classroom. The team coordinator, often the audiologist or hearing professional, assists the teacher with procedures to assure the implanted child is not a burden in the classroom. The speech-language pathologist evaluates the child's overall communicative functioning to establish performance baselines before implantation. Post-operatively the child is provided regular speech and language treatment with the goal of moving from profoundly deaf to hard of hearing status.

Parents are perhaps the most valuable members of the implant team. They are the advocate for the child and often their involvement determines the functional success of the procedure. It is very important that the parents have realistic expectations. Their enthusiasm or disappointment will be communicated to the child and impact upon outcome.

In contrast to the child's implant team, the adult team may consist only of the surgeon, audiologist, and family. A psychologist or speech language pathologist may participate according to specific patient needs.

Pre-Operative Evaluation

The pre-implant evaluation may take several months and begins with basic medical and audiological evaluations to identify the presence of general prerequisites. At this time the audiologist begins to help the candidate and family to understand the limitations and benefits of the implant and the commitment required for successful use.

If the candidate meets preliminary criteria, little or no benefit from powerful hearing aids, the next evaluation is speech recognition testing. At this time if the person does not wear hearing aids, a hearing aid is fitted and speech recognition tests administered to determine if benefits are received from the amplification. When the implant candidate is a child, a training period with a hearing aid or tactile device is undertaken. This procedure ensures that the child would not benefit from these traditional, noninvasive treatment modalities. The trial period is also used to establish hearing, speech and language baselines for comparison with post-implantation testing.

The medical evaluation includes a general physical examination to determine if the patient is able to undergo a two to four hour surgery. X-rays are taken to determine if the cochlea is free of bony deposits or any other obstruction that might block insertion of the electrode. In addition, if there is any doubt about the stimulability of the auditory nerve, the promontory test is performed. Here an electrode is placed through the tympanic membrane on the promontory of the cochlea and stimulation is presented. The stimuli is heard as a tone and the patient signifies its presence or absence. Patients who do not respond to this stimulation are not candidates for implantation. The procedures and tests recommended by the Cochlear Corporation are listed in Appendix 1 and Appendix 2.

A psychological evaluation may be helpful to examine expectations and motivation of the implant candidate and family. It also gives useful information about the willingness to participate in the post implant training.

Assessment Protocol

The basic adult test procedures are as follows:

I. Unaided audiometric testing under headphones.
II. Aided audiometric and speech testing in sound fields.
III. Speech reading assessment.
IV. Speech Recognition Testing
V. Patient and family expectations questionnaires.

The FDA approved pediatric evaluation is as follows:

I. Standard audiometric testing under earphones.
II. Evoked potentials (when indicated)
III. Hearing Aid Evaluations
IV. Hearing Aid and/or vibrotactile and trial Pre-training (when indicated) If the child is not wearing a hearing aid, a minimum 6 month trial with a hearing aid or tactile device is required.
V. Speech perception evaluation, Central Institutes for Deaf.

The Surgical Procedure

The surgical risks of the implantation are discussed carefully with each patient. Risks include infection or rejection of the implant, dizziness, and facial weakness. The facial nerve is very near the implanted electrode and could be injured during exposure of the round window or be electrically stimulated by the cochlear implant. This risk is minimized when the implant is performed by experienced ear surgeons. The surgery requires two hours and is performed under general anesthesia. An overnight hospital stay is necessary. After a week of recuperation most patients can resume their usual activities. Complete healing takes four to six weeks.

Post-Operative Management

Approximately four weeks after the implantation of the internal receiver, when the surgical site has healed, the patient returns to the audiologist for the initial fitting and programming of the speech processor. During the procedure the individual electrodes are programmed to match the hearing and comfort levels of the individual. The system is programmed by placing the speech processor in a custom interface and microcomputer unit. The processor is then adjusted to the individual. The speech processor uses a "feature extraction strategy" to select and code certain key elements of sound that have been determined to be most useful for understanding speech.

The fine tuning continues over several months as an ongoing rehabilitation program and allows the audiologist to evaluate the patient's progress. Programming the speech processor for a child takes longer. It may take several weeks to develop a long term program. It is recommended that a child be seen on a regular basis for the first six months to refine their programs as they gain more experience with sound. Follow up is at six-month intervals for two years and then annually.

The average post lingually deafened implant recipient requires twelve, two hour sessions, for adjusting the speech processor and rehabilitation. The individual who has been deaf for many years may require more sessions and additional therapy with a speech-language pathologist. Rehabilitation consists of auditory tasks that vary through four stages. Beginning with differentiating "same or different" (e.g. man vs baseball) and advancing to an open set where context is not known and without lipreading. Follow-up for adults is at two six month intervals then annually.

The Miami Institute Cochlear Implant Program

Sixrteen (16) profoundly deaf adults and four children have received multi-channel implants at Miami Ear Institute. Patients ranged in age from 12 to 74 years with a mean age for the adults of 57 years old. Four of the patients were deafened by ototoxicity, three as a result of

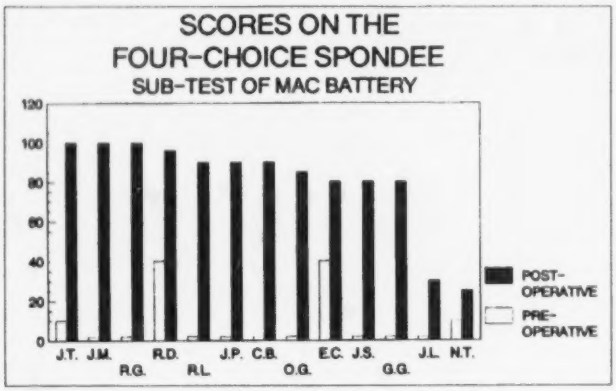

Figure 3

otosclerosis, six had meningitis, one viral infection, and three heredity causes. In three of the cases the causes of deafness was unknown.

A review of pre-operative audiologic assessments showed six of 18 patients to have no response to any pure tone at the maximum output of the audiometer. None of the remaining 12 demonstrated responses above 500 Hz, except one who had a response at 125 dB at 1000 Hz. Each demonstrated responses with a hearing aid that were inferior to those of the average implanted patient.

Eighteen of the cochlear implant recipients have experienced restoration of hearing sensation. Implant aided mean warble tone thresholds of 45 dB SPL across the frequency range of 250 to 4000 Hz were achieved. Of the remaining two patients, one expired due to medical problems not related to the Cochlear Implant; another has been explanted due to healing problems.

(Figure 3) demonstrates post-implant improvement on one or more of the closed set Minimal Auditory Capabilities (MAC) battery by 13 implant recipients. Eight of the subjects demonstrated measurable open set recognition.

The CID Sentences Test, administered to seven of the subjects (4 in English and 3 in Spanish version) yielded a pre-operative mean result of 0% and an average post-operative mean result of 45%. The average for the English-speaking subjects was 34% though one Spanish speaking subject scored 100% on the open phoneme test one month post-operatively. This individual had received her implant within one year of becoming deaf, at age 18, as a result of antibiotic ototoxicity.

Improved voice control by implant recipients during conversational speech has been reported by all families. Average use of the implant is 12 hours or more a day. Users who wear the processor less time have poorer results.

Of the eighteen patients who underwent cochlear implant surgery at our institute, five spoke Spanish as their native tongue and two spoke Hebrew. Since the authors knew of no accurate translation of the cochlear implant rehabilitation handbook to Spanish or Hebrew some translations and modifications of existing materials had to be made.

Case Reports

Case No. 1: (J. T.), age 72. "Before the cochlear implant I was deaf, now I never refer to myself as deaf". J.T. gradually lost his hearing over many years, and was totally deaf for 5 years before implantation. He wore a body hearing aid at the right ear but could not tolerate an aid at the left. He was implanted in April 1990, and the first stimulation took place June, 1990. J.T. had been expecting to hear only environmental sounds, but was delighted that within a week he could understand voices. He is now able to go to the doctor and other appointments without his daughter to interpret for him and evidences improved confidence, security and independence. He still carries his body aid in his pocket in case his speech processor malfunctions, but he rarely uses it.

Case No. 2: C.D., a 47 year-old Israeli woman, was implanted in October, 1989, after being deaf for 5 years. She returned to Israel in August, 1990. Upon her return she was appointed as chairwoman for the 4th International Congress of the International Federation of Hard of Hearing to be held in Israel in 1992. She stated she would never have been able to hear well enough with her hearing aid to carry out her duties nor would she have the self confidence to undertake the position. She enthusiastically explained that with her implant she was able to follow the events of "Operation Desert Storm" on television, as well as hear the alarm sirens and alerts.

Case No. 3: E.F. is a 64 year-old insurance executive who first had a 3-M single channel cochlear implant in 1983. He received the Cochlear 22 channel in November, 1987 on the other ear. He likes to compare the two units, but he only wears the multichannel unit. He reports that environmental sounds are heard better with the single channel unit, but his understanding ability for speech is markedly better with the multichannel system. Before the second implant, when using the 3M, he always had to have his wife accompany him on business meetings, but with the 22 channel device he is able to meet clients alone. He has even been able to have telephone conversations with his brother. His responses to closed set discrimination testing were 90-100%.

E.F. does not have natural speech reading ability and reports his mind is always filled with numerous tasks that he wishes to complete simultaneously. This mental orientation interferes with the concentration necessary for useful speech reading. This has created frustration and the feeling that the implant "needs adjustment". However, the patient's greatest moment of distress occurs when he is without sound even for a few hours. The implant has given him a new sense of security and improved his outlook.

All of the implanted patients, even those who are not as successful as the cases described, agree that the sounds they hear with implants enable them to participate in the hearing world and enables them to be more independent.

Implications

Cochlear implants have changed the way audiologists look at profoundly deaf individuals. Many deaf people who cannot benefit from a hearing aid may be able to function in the hearing world using a cochlear implant.

Audiologists play a critical role on the cochlear implant team. They are important not only in patient selection, but their skill in aural rehabilitation will influence the ultimate results achieved by the implant recipient. In some programs a speech-language pathologist provides the rehabilitation, while in others the audiologist has full responsibilities for tuning the speech processor and providing rehabilitation, including speech reading.

Audiologists and speech-language pathologists should know the criteria for cochlear implantation for both adults and children. Although many professionals will not be directly involved with a cochlear implant program, they may be in a position to counsel potential implant can-

didates. Professionals who are in contact with recently deafened individuals need to be aware that the sooner the person is implanted after losing hearing the better the prognosis for understanding speech.

Summary

The cochlear implant is an accepted tool in the armamentarium of the otologic surgeon and audiologist for the treatment of the patient with total deafness. The experience of the Miami Ear Institute at Mercy Hospital confirms the benefits of this method of intervention. The role of audiologist and often the speech-language pathologist has been strengthened in the medical arena.

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APPENDIX 1

RECOMMENDED PRE-IMPLANTATION ASSESSMENT PROCEDURES:

LEVEL I: Audiological Assessment
- Standard Audiometry and impedance testing
- Initial hearing aid evaluation
- Trial with appropriate hearing aid and/or tactile device
- Electronystagmography/caloric stimulation (optional)

LEVEL I: Medical Assessment
- Initial interview and preliminary examination
- Cochlear imaging
- Vestibular examination
- Electrical stimulation of the promontory
- Vision test (optional)
- Psychological assessment (optional)
- ABR or electrical ABR (optional)

LEVEL II: Speech Recognition Testing
- *Closed - Set*
- Forced Choice Spondee (Owens, et.al., 1981)
- Vowel MAC (II)
- Medial Consonant (Tyler, et.al., 1985)
- *Open - Set*
- Monosyllabic Words (NU #6) Iowa (Tyler, et.al., 1985)
  - word score
  - phoneme score
- CID Sentences MAC (VI) (Owens, et.al., 1981)
- Iowa Sentences without context Iowa (Tyler, et.al., 1985)

LEVEL II: Measure of Speech-Reading
- CID Sentences MAC (VI) (Tyler, et.al., 1985)
  - speech-reading only
  - speech-reading with sound

LEVEL III: Questionnaires and Counseling
- Expectations Questionnaire (Cochlear Corp. 1991)
- Performance inventory for Profound and Severe Loss Counseling

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APPENDIX 2

RECOMMENDED PREOPERATIVE PATIENT EVALUATION - PEDIATRIC

LEVEL I: Audiological Assessment
Standard audiometric testing under earphones
Oto-admittance testing
Evoked potentials (when indicated)
Hearing aid evaluation
Hearing aid and/or vibrotactile aid trial (when indicated)
Pretraining (when indicated)

If the child has not been fitted with appropriate amplification, a minimum 6-month trial with hearing aids and/or vibrotactile device is recommended under most conditions. An exception would be in the case of a post-meningitic child who is showing evidence on CT scans of ongoing ossification of the cochlea.

Children who demonstrate minimal attending skills or who are not under stimulus/response control should be given pretraining to develop these skills prior to beginning the speech perception evaluation.

LEVEL I: Medical Assessment
Initial interview and examination
Cochlear imaging
Electrical stimulation of the promontory or round window (when appropriate)
Electrical evoked potentials (optional)
Vision examination (optional)
Counseling

LEVEL II: Preoperative Selection Process
Speech Perception Evaluation (Best aided condition)

Closed-Set
Central Institute for the Deaf (CID) Early Speech Perception (ESP) Battery-Standard Version
ESP - Low Verval Version (use only with those children who do not have enough language to take the standard version)(Geers & Moog, 1990)
Northwestern University - Children's Perception of peech (NU-CHIPS) (Elliot & Katz, 1980)

Open-Set
Glendonal Auditory Screening Procedure (GASP)
Word Subtest (Erber & Alencewicz, 1976)
Minimal Auditory Capabilities Battery (MAC)
Spondee
Recognition MAC (III)
CID Sentences of Everyday Speech MAC (VI)
Phonetically Balanced Kindergarten (PKB) Words

Measure of Speechreading
Craig Lipreading Inventory -Word Recognition
speechreading only (Craig)
speechreading with sound
CID Sentences MAC (VI)
speechreading only
speechreading with sound

Recorded versions of these tests should be administered whenever possible. The ESP Battery, GASP, and Craig Lipreading Inventory are available through Cochlear Corporation as part of the Pediatric Test Materials and Programming Kit.

Speech and Language Evaluation
A preoperative speech and language evaluation is recommended using standardized tests whenever possible.

Psychological Evaluation
A psychological evaluation is recommended to assess verbal/nonverbal intelligence. The psychologist also plays an important role in counseling the patient and family regarding the cochlear implantation process and in assessing realistic expectations.

LEVEL III: Questionnaires and Counseling (Cochlear Corporation)
Expectations Questionnaires
Family Questionnaire
Teacher Questionnaires

LEVEL IV: Team Meeting to Determine Candidacy

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Post-Stroke Depression and its Treatment: A Literature Review

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ABSTRACT

Depression has been identified as a frequent, and perhaps oftentimes, overlooked consequence of stroke. The prevalence, symptoms, presumed underlying mechanisms, evolution, and treatment options for post-stroke depression are reviewed.

INTRODUCTION

Empirical evaluation of mood changes following stroke began in the late 1960's (Gainotti, 1972). Subsequently, a number of investigations have examined the occurrence of such changes post-stroke and their impact on recovery. The purpose of this article is to review post-stroke depression which is by far the most common mood disorder consequent to stroke. Prevalence, symptomatology, underlying mechanisms, and evolution will be discussed, as well as treatment techniques designed to alleviate the depression. It is hoped that this review will increase readers' awareness of the psychological devastation that may occur post-stroke, thereby increasing concern for the "whole" person rather than just one isolated symptom of stroke.

Prevalence

Results of a number of investigations have indicated that post-stroke depression is not an infrequent phenomenon. For example, in a group of patients followed by Robinson (1986) over a two year period post-stroke, major depression was found in approximately one-fourth. Symptoms of minor (dysthymic) depression were also common post-stroke, occurring in up to one-fourth of all stroke patients. Finally, Robinson found that one-third of the patients who did not develop depression immediately following the stroke developed depression between three months and two years post-stroke, a finding with major clinical implications.

It is notable that depression appears to occur with at least twice as great a frequency following stroke as it does in normal elderly living at home (Kay, Beamish & Roth, 1964; Murphy, 1982, Gurland & Copeland, 1982). Hence, it does not appear that the aging process alone is responsible for the depression found in patients following stroke.

Symptomatology

Robinson (1986) and Starkstein and Robinson (1989) have described the symptoms associated with major and minor depression. According to these investigators, more than half of the patients with major depression display the following symptoms: depressed mood, diurnal mood variations, loss of energy, anxiety or restlessness, loss of appetite, sleep disturbances, social withdrawal, and irritability. Also frequently noted are feelings of hopelessness, difficulty concentrating, loss of interest in usual activities, decreased libido, and suicidal thoughts.

Symptoms of minor depression that occur in more than half of the patients are depressed mood, anxiety, and restlessness. In addition, more than one-third of the patients have diurnal mood variations, feelings of hopelessness, loss of energy and delayed sleep onset, social withdrawal, brooding, tearfulness and a pessimistic attitude. Other complaints include early morning awakening, decreased appetite, self-deprecation, and suicidal thoughts. These symptoms described by Robinson (1986) and Starkstein and Robinson (1989) are in agreement with the symptom criteria for clinical depression described in the Diagnostic and Statistical Manual of Mental Disorders, third edition (DSM-III) (American Psychiatric Association, 1980).

Data supporting the distinction between major versus minor post-stroke depression have been presented by Robinson and his colleagues (1986, 1987, 1988, 1989, 1990). First, these two forms of depression differ in their association with lesion location. In addition, the evolution/resolution of major depression differs from that of minor depression and has been associated with significant intellectual decline. Finally, patients with major depression have shown a different response to the administration of dexamethasone during the Dexamethasone Suppression Test than patients with minor depressions.

Underlying Mechanisms

A number of theories have been advanced in an attempt to explain the etiology of post-stroke depression. Swindell and Hammons (1991) have named and summarized three such theories: Neuropharmacology Model, Neuroendocrine Model and Neuroanatomical Model. These models will be briefly described below. It should be emphasized that although these models may be plausible, none of them have been definitively confirmed to date.

Neuropharmacology Model

The neurotransmitter catecholamine norepinephrine, has been the most commonly discussed agent in terms of this model. Basically, the model suggests that a depletion of norepinephrine at functionally important adrenergic receptor sites results in depression.

This theory is supported by the association of major post-stroke depression and lesions having close proximity to the frontal pole. Specifically, Morrison, Molliver and Grzanna (1979) and Pickel, Segal, and Bloom (1974) have demonstrated that noradrenergic cell bodies sending main axonal tracts to terminal, downstream fibers, originate in the brain stem and project through the median forebrain bundle to the frontal cortex. The axons then arc posteriorly and run longitudinally through the deep cortical layers. Lesions disruption these pathways in the frontal cortex or basal ganglia likely affect terminal fibers. More posterior lesions would disrupt fewer downstream fibers, resulting in a less marked depletion of norepinephrine than more anterior cortical lesions.

Neuroendocrine Model

It is well recognized that the metabolism of hormones along the hypothalamic-pituitary-adrenal (HPA) axis and the pituitary-thyroid axis is not normal in depressed patients. In a normally functioning system, the hypothalamus reacts to stress by secreting corticotrophin-releasing factor (CRF). The presence of CRF then stimulates the pituitary gland to release adrenocorticotropihic hormone (ACTH), which then stimulates the adrenal glands to release glucocorticoids, of which cortisol is the primary hormone. Cortisol inhibits further release of CRF and ACTH in an attempt to reduce the physiologic effects of stress. In a circular way, therefore, elevated levels of cortisol inhibit its additional production. When stress is no longer present, cortisol levels normalize.

In a large percentage of depressed patients, cortisol is elevated and, in cases of major depression, its level does not diminish when challenged by dexamethasone, an exogenous cortisol, administered to the patient, in a procedure called the Dexamethasone Suppression Test (DST). Thus, results of DST have supported the neuroendocrine model which proposes that, in depression, there is a breakdown in the circular feedback system that regulates cortisol production.

Neuroanatomical Model

This model strives to identify the cortical/subcortical structures responsible for mediating emotions. According to Silverman and Weingartner (1986), three basic processes are involved in the recognition and regulation of emotion: interhemispheric activation, contralateral inhibition, and interhemispheric coupling. The left and right cerebral hemispheres appear to regulate different emotions intrahemispherically (i.e., positive emotions by the left hemisphere; negative emotions by the right hemisphere). The stability of moods, however, depends upon contralateral inhibition and interhemispheric coupling. Using this theory, it becomes easy to understand how the individual with a unilateral lesion loses the inhibition normally provided by the involved hemisphere. Thus, the explanation for the depression resulting from a left-hemisphere lesion is that the right-hemisphere is now uninhibited or deregulated, and continues to mediate negative emotions. In contrast, the finding that right-he nisphere lesions frequently result in lack of interest, joking and euphoria is based on the lack of inhibition of the left-hemisphere's positive emotional mediation.

Evolution of Post-Stroke Depression

Robinson and his colleagues have published a series of reports regarding the average duration and evolution of post-stroke depression. In their first report, Robinson and Price (1982) stated that the average duration of untreated depression from the time of diagnosis was eight to nine months. In addition, patients were more likely to develop depression during the first two years following stroke than they were from three to ten years post-stroke.

Robinson (1987) attempted to differentiate between the evolution of major versus minor depression during the first two years post-stroke. Patients with major depression were found to improve significantly between years one and two. In contrast, patients with minor depression did not demonstrate such improvement and some of these patients had actually developed major depression at the two year follow-up evaluation. Hence, major depression appears to have a natural course of approximately one year in duration, while minor depression more frequently has a longer course.

In an attempt to identify variables associated with rapid spontaneous recovery, Starkstein, Robinson, and Price (1988) compared patients who had recovered from their depression by six months post onset with those who had not recovered. Nonrecovered patients were found to have lesions in the cortex in the distribution of the middle cerebral artery. No patient in this group had purely subcortical damage or damage in the distribution of the posterior cerebral artery. Patients who did not recover from their depression also had a greater degree of physical impairment than patients who did recover spontaneously.

In contrast to the nonrecovered group, patients who had recovered from depression at six months post-stroke had predominantly subcortical lesions and lesions in the distribution of the posterior cerebral artery. These were also the patients who were less physically impaired than the recovered group.

Treatment Options for Post-Stroke Depression

The great majority of patients with post-stroke depression go without treatment. In a series of patients studied by Feibel and Springer (1982), less than 5% had received treatment by six months post-onset. In this section, a number of different treatment strategies for patients with post-stroke depression will be reviewed. Treatment strategies must be carefully selected according to the specific needs of each patient.

Medical Management
Pharmacotherapy

Robinson and his colleagues (1984, 1984, 1990) and others (Reding, Orto, Winter, et al; Finklestein, Weintraub, Davr, et al, 1987) have emphasized that treatment with antidepressants appears to be indicated for both major and minor post-stroke depressive disorders. The more commonly prescribed tricyclic antidepressants function to prolong the effects of pertinent neurotransmitters (i.e., norepinephrine, serotonin, and topamine) at the neuronal synapse. Robinson (1986) cautions, however, that antidepressants are contraindicated in some patients particularly the elderly, and may be associated with serious side effects.

Electroconvulsive Therapy (ECT)

Electroconvulsive therapy (ECT) has been found effective in the treatment of patients with post-stroke depression (Robinson & Starkstein, 1990). Although transient memory disturbances may occur following ECT (Fink, 1982, 1984), no neurologic deterioration has been noted (Murray, Shea & Conn, 1987). ECT would typically be prescribed when antidepressant therapy is not successful.

Psychotherapies

Family Systems Therapy

Family systems therapy is a systematic and interactional treatment approach wherein family members help each other reestablish family equilibrium. Wahrborg and Borenstein (1989), in their work with family systems therapy, have focused both on the relationships that constitute the family system and on the individual personalities. The technique utilized is based on systems theory, communication theory and process theory. Cooperation is emphasized and attitudes are reinforced accordingly.

Based on ten years of experience in treating aphasic patients and their families, Wahrborg and Borenstein (1989) found that family therapy was beneficial for both aphasic patients and family members. For the aphasic patients, notable changes were made in tendency toward depression, emotional isolation, impatience, social isolation and dependency. For family members, improvement was noted in level of irritation, quality of communication and quantity of communication.

Social Support Intervention Therapy

There is evidence that supportive interactions among people are protective against the consequences of life stress, such as depression (Cobb, 1976). Moreover, Nussbaum, Thompson and Robinson (1989) have stated that social support is particularly important in the elderly, the age group of most stroke patients.

The "buffering hypothesis" provides the conceptual framework for the mechanism through which social support is beneficial. This hypothesis suggests that the presence of social support may serve the following goals: 1) it may reduce the perceived impact of stress; 2) it may promote and facilitate healthier behaviors; and/or 3) it may tranquilize the neuroendocrine system, thus diminishing the physiologic response to stress.

Friedland and McColl (1987) studied patients during the first two years post-stroke and discovered four aspects of social support that offered a protective effect against poor psychosocial adjustment: 1) satisfaction with social support; 2) personal (the single most significant relationship in the individuals life) 3) friend (close friends and family); and 4) community (neighbors, friends, work colleagues, and service people). Based on these findings, Friedland & McColl (1989) developed an intervention program designed to capitalize on the hypothesized buffering effects of social support. Their social support intervention program consists of eight to twelve sessions attended by specially trained occupational therapists, the stroke patient and his/her support system. With the therapists and the client working as collaborators, the support system is developed and mobilized to enhance its involvement with the client. Change is expected in the support system - not in the client. The combination of different sources of support (i.e., personal, friend, and community) ensures that any one source is not relied on excessively. Should a patient not have a "natural" social network, a devised social network, using volunteers, community leaders, or mutual self-support groups can be employed (Turkat, 1980).

Pet Facilitated Therapy

Pets have been found to have both a psychologic and a physiologic impact on individuals with whom they interact (Carmack, 1991). Pet therapy is a non-traditional treatment that is cost effective and beneficial. It can be implemented in a variety of ways and across a variety of settings. It involves introduction of a pet to a patient, with careful consideration of matching personalities within pet/patient pairs. Patients are allowed to bond and interact with a pet over time. Both live-in and temporary pet visitation arrangements have been used. Like social support, pet-facilitated therapy may be viewed as having a "buffering effect" by reducing the perceived impact of stress. Thus, it may promote and facilitate healthier behaviors.

Cognitive Therapy

Cognitive therapy is an active, direct, time-limited, structured approach used to treat a variety of psychiatric disorders, including depression (Beck, Rush, Shaw, et al., 1979). The theory underlying this approach is that an individual's affect and behavior are largely determined by the way in which s/he perceives the world.

The therapy implements highly specific learning techniques designed to identify, reality-test, and correct distorted conceptualizations and the dysfunctional beliefs underlying them. Behavioral rather than verbal techniques are used with more severely depressed patients or patients who would have difficulty engaging in introspection (i.e., aphasics). The therapist, trained in the cognitive model of psychotherapy, helps the individual to think and behave more realistically and adaptively about his psychological problems. This, in turn, tends to reduce depressive symptoms. Therapy typically consists of 15 to 25 weekly sessions with follow-up treatment recommended three to four times during the year following termination of formal therapy.

Systematic studies of cognitive therapy in the treatment of depression have been promising. However, its effectiveness has not been demonstrated for the treatment of post-stroke depression. Because of its cognitive orientation, it would seem to be useful only for those patients who are not severely compromised in terms of cognitive or linguistic functioning.

Laughter and Humor

A number of investigators have found that laughter and a sense of humor have a positive impact on the reduction of stress (Cousins, 1979; Dugan, 1989; Martin & Lefcourt, 1983) discomfort levels (Cousins, 1979; Cogan, Cogan, Waltz, et al., 1987), and depression (Martin & Lefcourt, 1983; Ljungdahl, 1989; Schmitt, 1990). According to Schmitt (1990), humor results in attitudinal or affective changes that may cause psychological changes. Humor that results in laughter may actually interrupt an ongoing downward psychological spiral that, if left unresolved, may result in depression. Peter and Dana (1982) have stated that humor helps relieve feelings of disappointment, guilt and lack of self worth in depressed patients. It is these views of humor that has led to its use in psychotherapy.

Humor can be introduced to patients and families in "humor-groups" (Ljungdahl, 1989) or on an individual basis (Schmitt, 1990) in a number of forms including jokes, humorous videotapes/films, television and comic books. Moreover, therapists from any training background can integrate humor into their routine treatment in an attempt to alleviate post-stroke depression and the depression experienced by family members.

Summary

Depression has been documented as a relatively frequent consequence of stroke and unfortunately it is often ignored by health-care providers. Since it appears to be amenable to a variety of different treat-

ments, it is imperative that physicians and other health professionals be educated regarding post-stroke depression to ensure that a greater percentage of patients receive an accurate diagnosis and subsequent treatment.

A number of recent investigations have emphasized the interactions among brain damage, psychological reactions, language impairment, and social changes. Hence, an interdisciplinary approach is crucial in the management of post-stroke depression, particularly when aphasia is a complicating factor. In essence, concern for the "whole" person, and not isolated elements, is the key to total rehabilitation for the post-stroke patient.

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Phonatory Facilitation Using The Method Of Lombard

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ABSTRACT

The method of Lombard has been available as a phonatory facilitator since 1917 when Lombard first used masking noise to successfully facilitate phonation in three cases of "hysterical" aphonia. This paper describes the Lombard method and use of the Lombard effect to facilitate phonation . Considerations regarding the Lombard effect are discussed.

INTRODUCTION

Initially discovered in 1909 (Lane & Tranel, 1971), it was reported that a patient's voice level increased with the introduction of masking noise and lowered, resuming its former level, with the cessation of noise. The effect was reported in 1911 in Lombard's classic article, "Le signe de l'elevation de la voix," (Lombard, 1911). Bearing the name of its founder, the Lombard effect has been used primarily to rule out pseudohypacuis (Olsen, 1991). The effect has been used therapeutically with disordered phonation as well. In 1917, Lombard and Baldenwick (1916-17) published a clinical report relating the successful use of masking noise as a phonatory facilitator for three patients described as hysterically aphonic. More recently, Boone (1977) suggested the use of masking noise to facilitate a louder, clearer, more optimal phonation in functionally dysphonic patients usually without laryngeal pathology and a presenting vocal loudness problem of too soft a voice.

The Lombard Effect

Egan (1975) translated an excerpt from Lombard's manuscript of 1916-17 in which the clinical utilization of the procedure was described.

"...the subject is instructed to count from one to ten. The tester counts with him, making sure that the patient's eyes are fixed on his lips. This part of the treatment is purely psychological. At the prompting of the doctor, the patient never delays in moving his own lips, and soon a breathy voice appears... Keeping the masking noise constant, then moving the headphones away from the ears when the voice has reached normal intensity, the subject hears his own voice..."

Lombard did not specify the intensity of masking noise required to elicit this response other than the noise be somewhat loud. Thereafter, Egan (1972) and Korn (1954) reported that levels of 70 to 80 dB re: audiometric zero, are needed to elicit the voice intensity increase. Boone (1977) suggested beginning at 40 dB SPL in clinical practice, then gradually increasing the intensity of the signal to as much as 90 dB SPL or higher. Throughout the procedure, the person being treated is audio recorded. Once vocal loudness and quality are improved in response to the masking noise, it is useful to allow 30 seconds of uninterrupted utterance in an attempt to establish this "new-found" phonation prior to removing the headphones from the patient's ears. With removal of the headphones, the patient upon hearing his/her voice generally maintains this voice. The audio recording obtained during the session serves as a target voice model for the patient in treatment. Phonatory facilitation using the Lombard effect is a phenomenon that is expected to occur with immediacy. Repeated unsuccessful attempts to facilitate phonation will be futile and will likely be indicative of neurogenic etiology or severe bilateral sensorineural hearing loss. Persons with severe bilateral sensorineural hearing loss are not likely to be very responsive to this protocol because of the hearing loss. Persons with unilateral hearing loss should respond to the presentation of noise to the better ear.

The Lombard procedure has been used with success by this clinician on numerous occasions. Three cases for whom the procedure proved efficacious are highlighted briefly in this report.

CASE REPORTS

Traumatic Brain Injury

Case 1 was a 24 year-old white male construction laborer and two year community college graduate who suffered traumatic brain injury (closed head) in a moving vehicle accident. Upon admission to the medical center intensive care unit, the patient was described as "decerebrate" and remained comatose for a period of 15 days. Computerized axial tomography indicated peripheral contusion of the right cerebral hemisphere. No fractures were identified on skull films.

At five weeks post onset, a consultation request was completed via the Division of Rehabilitation Medicine. The patient was described as being "awake, unresponsive to verbal stimuli" and "mute," making no attempt to communicate verbally. Clinical neurological consultation additionally indicated evidence of "severe left hemisphere deficit" including right hemiplegia and "aphasia" secondary to head trauma.

When referred for speech language pathology evaluation at 6 weeks post onset the patient was aphonic and presented with cognitive and linguistic disorder. At eight weeks post injury, a barely audible whispered phonation was elicited. This whispered phonation was brief and infrequent. Elicitation of vegetative sound was unsuccessful.

The author and an audiologist colleague scheduled the patient for the use of masking noise to attempt to elicit phonation beyond the patient's recently facilitated intermittent whisper. The patient was instructed that he would be asked to say his name while noise was presented through earphones. The patient was seated in the audiometric test booth with his back to the audiologist in the control booth. The speech-language pathologist sat in the test booth facing the patient and the audiologist and signalled the audiologist to increase the masking level. White noise masking was presented to the patient bilaterally through the earphones at 40 dB HL. The patient was asked to say his name. Whispered phonation was elicited at that level. White noise was then increased in 10 dB increments. At 80 db of white noise, phonation was elicited. The speech language pathologist prompted the patient to continue verbalizing his name and removed the headphones. He was then encouraged to verbalize additional words on imitation. He successfully produced "yes", "no", "hi" and "bye". Upon leaving the audiometric sound suite the patient resorted to whispered voice. He was taken back to the test booth and the procedure was repeated. Voicing was obtained at 60 dB and maintained thereafter.

Cerebrovascular Accident

Case 2 was a 62 year old white female who suffered a left hemispheric cerebrovascular accident involving the distribution of the middle cerebral artery. At the time of admission the patient was described as "severely aphasic with right hemiplegia." At three weeks post onset it was observed that the patient could follow three and four stage commands and was able to read with comprehension, paragraph level material. She was also appropriate in interpersonal communication using gestures and mimicry, either independent of or in conjunction with mouthing of words. There was no evidence of bilateral upper motor neuron or lower motor neuron involvement in the patient's medical record. Attempts to elicit a whisper, vegetative sound, or voice were not successful. The Lombard protocol was attempted using the masking strategy described earlier. Phonation was successfully elicited at 70 db HL and was maintained after removal of the headphones. Thereafter, phonation was unremarkable.

Functional Aphonia

Case 3 was a 36 year old black female who presented with aphonia of two months' duration. The patient's mother reported that the patient had lost her voice, usually for no longer than several days, on approximately six previous occasions within a three year period. Indirect mirror laryngoscopy by ENT showed no laryngeal pathology. Review of case history information indicated no physically or emotionally traumatic episodes. Masking noise was presented to the patient as was described for Case 1. At 80 db HL, the headphones were removed from the patient who, to her surprise, was phonating in what was described by both the patient and her mother as a "natural voice." Follow-up six months after discharging the patient from one month of treatment indicated no further vocal loss or difficulty.

Discussion

Clinically, it has been assumed that demonstration of the Lombard effect, the disappearance of vocal symptoms, differentiates functional from organic voice disorders. The preceding case presentations would suggest that the persistence of aphonia or intermittent whisper was primarily the result of functional considerations. However, the effect of traumatic brain injury or cerebrovascular accident on the genesis of this phenomenon is complex. Nathan (1947) reported that in patients presenting traumatic lesions involving the left frontoparietal area, it is not uncommon to observe an initial disturbance of phonation of such severity that it is difficult to elicit sound through any means. Rubens (1975) described a patient who suffered a unilateral lesion to the cingulate cortex and supplementary motor areas. Whispered utterances preceded voiced utterances which were observed within several days. Jurgens and von Cramon (1982) published a case report of a 41-year old male who suffered injury to the anterior cingulate cortex. Mutism was exhibited for six weeks. No volitional utterances were produced although groans of pain were occasionally heard. Whisper later replaced muteness but phonation of verbal utterances was absent. At ten weeks post onset, phonation was recovered but monotonous intonation persisted. Whether such spontaneous recovery of phonation might have occurred in Case 1 (TBI) or Case 2 (CVA) is difficult to say.

Lane and Trane (1971) have comprehensively reviewed theoretical considerations underlying the Lombard effect. Before their writings, it was generally accepted that the Lombard sign demonstrated the interdependence between speaking and listening; that there exists a private loop served by interoceoptors that transduce touch and bodily movement. In contrast, Lane and Trane proposed a public exteroceptive loop and suggested that a speaker, "...tries to maintain a speech-to-noise ratio favorable for communication...requiring mediation from another person and ...may be used for indirect self-monitoring; it permits the speaker to observe the consequences of his speech on the vocal and nonvocal behavior of his audience, and to regulate speech accordingly (in general, unconsciously)." (p 695). The authors contend that exteroceptors are used for direct self-monitoring, such as auditory self-monitoring and occurs in special cases where the public loop is effectively short circuited as in eliciting the Lombard effect, "the speaker does not raise his voice level to communicate better with himself, but rather with others." (p.695).

A consideration in using the method of Lombard is that of treating a symptom when an underlying disorder is supposed. Case 3 was a patient who presented with "functional aphonia". Historically, this phenomenon has been referred to as hysterical or conversion aphonia. Conversion is defined in the Diagnostic and Statistical Manual of Mental Disorders - IIIR (1987) as "...an alteration or loss of physical functioning that suggests physical disorder, but that instead is apparently an expression of a psychological conflict or need." It may be implied that treatment and resolution of a symptom, in this case aphonia, will not resolve the causal psychological conflict or need and the conversion reaction may return or persist. In clinical practice this does not always hold true. As demonstrated by Case 3, and observed by Boone, (1983), "The complete return of voice... is not unusual. Most functional (hysterical) aphonic patients present an excellent prognosis." (p.66).

Summary

The clinical use of the Lombard effect to facilitate phonation in three aphonic patients has been presented. These cases and the literature reviewed suggest that the use of masking noise resulting in the Lombard effect seems to facilitate rein-

tegration of a previously disrupted mechanism or, as Boone (1983) writes, establishes "...the 'proper' set for more optimal phonation." (p.143). Additional and more comprehensive studies of patients for whom this procedure is effective should promote improved patient selection, explanation, and verification of benefits.

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INTERDISCIPLINARY EVALUATION OF PEDIATRIC FEEDING AND SWALLOWING DISORDERS: Perspectives of Speech - Language Pathology in Healthcare

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ABSTRACT

An interdisciplinary team approach to the assessment and management of pediatric feeding and swallowing disorders is presented. The evolution of the interdisciplinary team, population served, protocol used, and qualifications necessary for the speech-language pathologist are reviewed.

INTRODUCTION

The evaluation and management of pediatric feeding and swallowing disorders is a complex and challenging activity for healthcare providers (Fox, 1990; Kramer, 1989). Pediatric dysphagia and related conditions may be secondary to a number of medical and behavioral disorders including prematurity (Shapiro & Healy, 1988; Tuchman, 1988; Weiss, 1988; Tuchman, 1989), central nervous system dysfunction (seizure disorder, cerebral palsy, traumatic brain injury, or mental retardation); chronic pulmonary conditions (bronchopulmonary dysplasia and tracheomalacia); gastrointestinal disorders (short bowel syndrome and gastroesophageal reflux); craniofacial anomalies and developmental delay (Kramer, 1989; Tuchman, 1988; Weiss, 1988; Loughlin, 1989; Tuchman, 1989).

Definition of the cause and effects of pediatric feeding and swallowing disorders requires analysis of factors that include comparisons of individual patient data to norms for anatomic growth and development of the oral and pharyngeal structures, neuromotor development, cognitive abilities, and psychosocial factors involving social relations and parent-child bonding (Tuchman, 1988; Fox, 1990; Tuchman, 1989). The complexity of the disorder(s) requires a broad based assessment and management approach that brings many specific areas of expertise together. The Feeding and Swallowing Disorder Team at Miami Children's Hospital was established to provide such expertise to address this complex problem.

Evolution of the Team

Prior to the development of the Feeding and Swallowing Disorder Team, the Speech-Language Pathology Department had been one of the primary care providers taking responsibility for evaluation and treatment of oral-motor, feeding and swallowing problems. Over an eleven year period, Speech-Language Pathology served as a resource for information regarding a patient's ability to safely take adequate nutrition by oral feeding. Usually, the speech-language pathologist made recommendations based primarily on a clinical bedside examination. The results were used to decide if alternative nutritional systems such as gastrostomy tubes or jejunostomy tubes were necessary. Because of the complex interaction of cause/effect and development/disorder, the speech-language pathologist relied also on the expertise of other medical and allied health care specialties such as dietetics, occupational therapy, physical therapy, gastroenterology, pulmonary medicine and others. The lack of a defined feeding/swallowing network and protocol made coordination of services and information difficult at best. It was apparent that such pediatric patients needed a more comprehensive and efficient assessment and management program.

With the support of various hospital departments involved with dysphagic patients, the planning and development of an interdisciplinary Feeding and Swallowing Disorder Team was begun. The status of dysphagia teams in other hospitals was investigated and literature reviewed to identify existing philosophies, protocols, and procedures. A team of professionals was organized to include two medical co-directors, a pulmonologist and a gastroenterologist, as well as a radiologist, nurse practitioner, occupational therapist, dietician, and the speech-language pathologist who served as the patient coordinator. Finally, a written protocol stating the purpose, policy, referral criteria and designation of team members and their responsibilities was formulated. The team then developed an interdisciplinary evaluation for videofluoroscopic examination of pediatric patients with significant feeding and swallowing disorders.

Population Served

Criteria for referral to the team include history of feeding and swallowing difficulties involving risk for aspiration, recurrent upper respiratory infection, recurrent pneumonia and increased congestion during, or after feedings. Other clinical criteria include structural deficits in the oral-pharyngeal mechanism, failure to thrive, poor weight gain and inad-

equate oral-intake necessitating the need for supplemental or alternative nutritional systems (Fox, 1990; Tuchman, 1989; Zerilli, Stefans & DiPietro, 1990; Shapiro & Healy, 1988; Loughlin, 1989).

Patients have been evaluated on either an inpatient or outpatient basis over a two day period. A clinical protocol is completed on day 1 and the videofluoroscopic swallow study is completed on day 2. The clinical protocol takes approximately three to four hours to complete. Because of the medically complex and fragile nature of the population seen, the team believes that more reliable results are obtained when the evaluation is completed over this two day period because it allows for control of variables such as fatigue, irritability, overstimulation, and compliance.

A large percentage of the feeding/swallowing disordered patients present with multiple disabilities. Table 1 presents raw data for the primary medical diagnosis of patients seen during the first ten month period of operation. Table 2 presents diagnostic categories by percentage for patients seen.

Patients ranged in age from 3 weeks to 22 years. Seventy percent (70%) of the patients were between the ages of 3 weeks to 5-0 years, eighteen percent (18%) were between the ages of 5-1 to 10-0 years, and twelve percent (12%) were 10-1 years and older.

Procedure

A physician referral is required for the interdisciplinary evaluation. Following referral to the team, the speech-language pathologist as patient coordinator completes a patient screening to determine candidacy. Outpatient screenings are completed via parent interview by telephone, and inpatient screenings by medical chart review. Appropriate candidates are scheduled for the clinical protocol. The protocol includes a physical examination by one of the team's physicians, the clinical oral-motor/feeding and swallowing assessment by the speech-language pathologist, an occupational therapy screening by the occupational therapist and a nutrition consultation by the dietician. All team members are responsible for obtaining a detailed case history with particular emphasis on their area of specialty.

Patients are assigned to Gastroenterology or Pulmonology depending on their history and presenting complaint. That physician obtains and evaluates the medical history and completes the physical exam, with emphasis on gastrointestinal or pulmonary function as it relates to swallowing dysfunction, and writes medical orders for required tests or procedures. The nurse practitioner participates in the physical examination and assists the physician in the evaluation process. The dietician evaluates nutrition and hydration status, providing information relative to present diet and anthropometric measures of weight and height (Tuchman, 1989). The results of the occupational therapy (OT) screening provide specific recommendations regarding patient positioning and adaptive seating systems for use during videofluoroscopy as well as information regarding neuromotor and sensory status, and self-feeding skills (Fox, 1990).

Table 1. The primary medical diagnoses of patients seen by the MCH Feeding and Swallowing Disorder Team during the initial 10 months (N=82).

Primary Medical Diagnosis	Number of Patients Seen
Bronchopulmonary Dysplasia	6
Respiratory Distress	2
Bronchiolitis	1
Upper Respiratory Infection	2
Status post Tracheomalacia	2
Hyperactive Airway Disease	2
Asthma	1
Pneumonia (Recurrent and aspiration)	6
Gastroenteritis	3
Gastroesophageal Reflux	6
Pylorospasm	1
Feeding Difficulty	1
Malnutrition	2
Chronic Abdominal Pain	1
Persistent Esophageal Stricture	1
Seizure Disorder	7
Cerebral Palsy	6
Hydrocephalus	2
Encephalopathy	3
Spastic Quadriparesis	1
Generalized Hypotonia	1
Infantile Neuraxonal Dystrophy	1
Muscular Dystrophy	1
Hypoxia	1
Apnea	4
Encephalitis	1
Arterio Venous Malformation	1
Status Post Brain Tumor	2
Syndromes (including Acardi, Fanconi, Marden Walker, Noonan, De Morsier's, Rubenstein Tabey, Beckwith Weiderman, Treacher Collins)	8
Chromosome Abnormality (4-P deletion)	1
Agenesis of the corpus callosum	1
Collagen Vascular Disease	1
Congenital Heart Disease	1
Midline orofacial cleft	1
Adenoidectomy	1
TOTAL	82

Table 2. The percentage of dysphagia patients seen by the Feeding and Swallowing Disorder Team by diagnostic category.

Medical Diagnosis	% of Patients
Neurological diagnosis	39%
Pulmonary diagnosis	27%
Gastroenterologic diagnosis	18%
Genetic diagnosis	11%
Other diagnosis	5%

The speech-language pathology assessment protocol is designed to evaluate the patient's oral-motor, feeding and swallowing ability with reference to developmental and functional paradigms. It provides important information regarding status of oral structures and reflexes; oral-motor, respiratory and swallowing patterns; and identifies appropriate food consistencies, temperature and method of presentation for the videofluoroscopic swallow study (Fox, 1990; Tuchman, 1989).

The speech-language pathologist counsels the parent/caregiver regarding the videofluoroscopic procedure. The parent is educated regarding bolus size, delivery, placement of the bolus, and is shown facilitating/compensatory techniques (if indicated) to be used during the procedure. The parent is instructed to withhold food and drink from the child for four hours prior to the scheduled swallow study to ensure that the child is hungry.

With infants and children, family involvement is critical in the diagnostic and treatment phases of management. Parents and primary caregivers are crucial in providing medical and developmental history and in describing the chronology of the child's feeding and swallowing problems. Because families are often the cornerstone of change for children, they must be included in the entire medical management process.

The Videofluoroscopic Swallow Study

Videofluoroscopy is the radiographic procedure of choice in evaluating swal-

lowing disorders in infants and children. Using this procedure we have identified a high incidence of silent aspiration, particularly with those patients having multiple disabilities (Fox, 1990; Kramer, 1989; Tuchman, 1989; Shapiro & Healy, 1988). A highly filtered, low dose fluoroscopy unit is used. The study provides information on the oral, pharyngeal and esophageal phases of swallowing and provides objective evidence of oral-pharyngeal motility. Results provide information to identify contraindications for safe oral feeding, document the presence and degree of any tracheal aspiration and assist in more specific delineation of the pathophysiology of swallowing (Fox, 1990; Zerilli, Stefans & DiPietro, 1990).

Videofluoroscopy also provides information critical for the design of treatment/management programs. The procedure is recorded on a standard, high grade videotape and is available for review by the physician who referred the patient to the team, parents and members of the patient's treatment team.

The team's physician, radiologist and speech-language pathologist are present during the videofluoroscopic procedure. Before the procedure, the physician and speech-language pathologist provide the radiologist with a report on both the patient's history and feeding/swallowing complaint, as well as results of the clinical oral-motor/feeding and swallowing assessment. The videofluoroscopic procedure is completed by the radiologist and the speech-language pathologist. The speech-language pathologist positions the patient, prepares the pre-determined barium-impregnated food and drink and implements compensatory techniques including variations in bolus size, texture, placement and posture. The infant or child is seated in a radiolucent seating system with specific adaptations determined during the OT screening. The child is first examined in a manner similar to the usual feeding position. To reduce the child's anxiety and to promote parent/family involvement, the parent/caregiver under guidance, is allowed to do the feeding. Non-oral feeders are positioned to provide proper body alignment with a stable postural and positional base for feeding and swallowing.

The radiologist examines the patient in the lateral projection with anterior-posterior (AP) projection used if clinically indicated. The examination begins with the oral mechanism including jaw, lips, tongue and soft-palate then advances to the laryngeal, pharyngeal and esophageal mechanisms including the vallecullae, epiglottis, vocal folds, pyriform sinuses and upper esophageal sphincter. The swallow study is reviewed by the three team members present and a videofluoroscopic swallow study analysis sheet is completed by the radiologist and the speech-language pathologist. The radiologist is responsible for dictating the official videofluoroscopy report.

The Feeding and Swallowing Disorder Team meets once weekly for 1 to 1½ hours to discuss findings, review the videofluoroscopic procedure and prepare recommendations for both the referring physician and the patient's family. The team report is then mailed to the referring physician and to the patient's family. Performance of the team is exemplified in the following case report.

Case Report

W.M., a 7 year old female, was referred to the Feeding and Swallowing Disorder Team by her neurologist to determine her candidacy for an alternative nutritional system. W.M.'s medical history included aspiration and recurrent pneumonia, gastroesophageal reflux, microcephaly, spastic quadriparesis, psychomotor delay, communication deficit, optic atrophy and visual impairment. There was also a history of significant feeding and swallowing difficulties. At home and school, all intake was the consistency of a thickened milk shake and was drunk from a cup. This was the sole consistency offered as it proved to be most efficient for the family and educational team at school. Other food consistencies such as semi-solids and solids, required an average 1 to 1½ hours to consume. W.M. was receiving physical therapy, occupational therapy and oral-motor/feeding and swallowing treatment at school.

Following a telephone interview and screening by the speech-language pathologist, W.M. was scheduled for the outpatient interdisciplinary team evaluation. Disciplines involved included radiology, gastroenterology, dietary, occupational therapy and speech-language pathology. W.M. was seen for the clinical protocol on day one and the videofluoroscopic swallow study on day two.

The team's findings included an essentially unremarkable physical examination with stable vital signs and clear chest to auscultation and percussion. A significant oral-motor/feeding and swallowing disorder was characterized by abnormal oral-motor patterns and incoordinated respiratory and swallowing patterns during feeding. Other findings included a neuromotor disorder with extensor posturing and abnormal reflexes negatively influencing head positioning for feeding. W.M.'s anthropometric values were normal with appropriate weight for height. However, her nutrient and fluid intake were inadequate. The videofluoroscopic swallow study documented tracheal aspiration with all consistencies offered including thin liquid, thickened liquid and semi-solid/pureed. There was no presence of a cough or gag with aspiration. Marked aerophagia (swallowing of air) was identified. There was also evidence of tracheal kinking subglotically. Based on the team's findings, it was recommended that W.M. receive a gastrostomy tube (GT) with Nissen fundoplication. Also, it was recommended that after the GT placement, W.M.'s diet be recalculated to offer appropriate fluids and nutrients via the GT. It was suggested that W.M. continue occupational therapy, physical therapy and oral-motor/feeding and swallowing treatment at school. Parent education and counselling was suggested.

Implications for the Speech-Language Pathologist

The interdisciplinary approach to the assessment and management of pediatric feeding and swallowing disorders has been very successful. The nature of pediatric disorders requires the involvement of many professional specialties. The speech-language pathologist assumes a pivotal team role by coordinating the patient/team interaction and in the assessment and management of pediatric patients with life threatening feeding and swallowing dysfunction.

To meet the needs of this special population, the speech-language pathologist in the medical environment must have knowledge of the anatomy and physiology of the oral, pharyngeal and esophageal mechanism; normal growth and development of anatomic structures that relate to feeding, swallowing and respiration; and knowledge of normal development of oral-motor patterns that affect feeding and swallowing. The speech-language pathologist must also be aware of the clinical symptomatology of feeding

and swallowing disorders and be familiar with the related medical diagnoses and etiologies.

Clinical competencies include experience in diagnostic procedures and instruments used to assess and treat feeding and swallowing dysfunction in the medical setting. Finally, the speech-language pathologist who serves as coordinator or team leader must possess the necessary management skills to enable integration of the different healthcare specialties to achieve true interdisciplinary dysphagia management.

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The Role of the Speech-Language Pathologist in the Comprehensive Epilepsy Center (CEC)

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ABSTRACT

The speech-language pathologist working in a comprehensive epilepsy center must have a firm understanding of epilepsy and its management. This article discusses epilepsy, phases of intervention, and the role of the speech-language pathologist on the epilepsy team.

INTRODUCTION

Focal epilepsy affects approximately 800,000 persons in the United States. According to recent statistics, less than one third of these individuals achieve full control of seizures for one year on a single medication and only 20% of the failures achieve full control of seizures with two drug (combination) therapy (V.A. Newsletter for Epilepsy, 1984). Thus, more than 350,000 patients with focal epilepsy are medical failures or are considered intractable i.e., acceptable seizure control has not been achieved despite trials with effective drugs at dosage levels in the therapeutic or supratherapeutic range (Spencer and Spencer, 1985). It has been estimated that at least 100,000 persons in the U.S. who are presently uncontrolled by antiepileptic drugs (AED's) might be managed more successfully by surgery (Commission for the Control of Epilepsy, 1978).

Surgical management of epilepsy has become a viable therapeutic option for children with drug resistant seizures (Duchowny, 1989). Improvements in seizure classification and cortical localization of seizure origin have resulted in a greater number of children who are candidates for surgery at earlier ages. The surgical management of epilepsy in children who have been considered medical failures can significantly benefit cognitive, psychosocial, and academic development.

Three major surgical procedures that have relatively low complication rates have been performed successfully in children. These are focal resection, for seizures originating from focally abnormal brain regions; corpus callosotomy, for generalized seizure activity or bilaterally independent foci; and hemispherectomy, for intractable partial seizures in young patients with hemiplegia and homonomous hemianopia (Duchowny, 1989).

The acknowledgment that epilepsy can impact upon a child's total development has led to the establishment of the Comprehensive Epilepsy Center (CEC) at the Miami Children's Hospital. The purpose of the Center is to provide state-of-the-art evaluation and treatment for children, adolescents and young adults who present with intractable seizure disorder and associated disabilities.

The CEC utilizes a variety of professionals within an interdisciplinary paradigm. Members of the team include a neurologist/epileptologist, neurosurgeon, registered nurse, neuropsychologist, social worker, pharmacokineticist, EEG technologist, neurophysiologist, polysomnographer, clinical psychologist and speech-language pathologist. Consultative services are provided by an audiologist. The team's registered nurse acts as the clinical coordinator. The goal of the team is to accurately characterize abnormal brain function and to establish an effective therapeutic regimen that will maximize cognitive, linguistic, academic, psychosocial and vocational potential.

Speech and Language in Patients With Intractable Epilepsy

There is limited information that specifically addresses speech and language deficits in epileptic children. Adolescents and adults with temporal lobe epilepsy are known to exhibit subtle language disturbances that can be significant predictors of memory and learning performance (Herman, Wyler & Somes, 1991). Mild generalized language impairments have been found in patients with an epileptogenic lesion in the dominant temporal lobe (Herman, Wyler, & Somes, 1991). These mild impairments usually manifest themselves in the patient's reduced efficiency in processing narrative verbal information (Prevey, Delaney & Mattson, 1988). This inefficiency may be due to the limited recall of details, particularly in temporally limited situations (Prevey, Delaney & Mattson, 1988). Memory deficits also occur with temporal lobe epilepsy after temporal lobectomy (Milner, 1975). Since the dominant temporal lobe is important for naming, naming problems have occurred in patients with dominant temporal lobe epilepsy, although these problems do not appear consistently with all patients (Mayeux, Brandt, Rosen & Benson, 1980).

Speech and Language Pathology Test Protocol

Traditional language assessments are not sufficient to detect the subtle language processing abilities of pediatric epileptic patients. These children may perform adequately on a conventional speech-language test battery, particularly when time is not a factor. In light of this, test instruments have been identified that evaluate linguistic processing across syntactic, semantic and pragmatic domains in temporally limited contexts. The Porch Index of Communicative Abilities in Children (PICAC), measures verbal, gestural, and

graphic abilities in a highly-structured context. The Revised Token Test (RTT), assesses auditory processing abilities in progressively more demanding linguistic contexts. The Test of Word Finding (TWF) assesses accuracy and speed in naming. In addition, the use of a video narration task has been valuable in documenting subtle language production disturbances (Dollaghan, Campbell & Tomlin, 1990). The task requires the child to view and simultaneously describe/narrate an animated videotaped story. Narration demands more complex syntax, offers less discourse support, and poses more organizational problems than conversation thereby taxing speech production and revealing more subtle communicative breakdowns (Maclachlan & Chapman, 1988). Additional tests that may be included in the protocol are listed in Appendices A and B. Test selection is individualized according to the patient's developmental level and presenting complaint.

Necessary Competencies of the Speech -Language Pathologist

The speech-language pathologist working with individuals with epilepsy must have prerequisite knowledge in several areas. These areas should include: anatomy and physiology of the brain; etiology, symptomatology, and clinical manifestations of epilepsy; the impact of this specific brain dysfunction upon speech, language, and auditory processing abilities; and, the impact of these sequelae on general development. Knowledge of other disciplines and their contribution to successful patient management is critical, therefore, optimal patient care dictates an interdisciplinary team approach.

The Comprehensive Epilepsy Center

The CEC intervention program consists of three phases. A review of the patient medical history is used to determine if the child is an appropriate candidate for admission into Phase I. Generally, a child is considered a viable candidate if the medical history indicates refractory or intractable epilepsy of at least two years in duration despite appropriate pharmacotherapeutic management (Duchowny, 1989). The patient is then admitted to the hospital for Phase I where comprehensive evaluations are conducted by team members. Invasive and continuous monitoring occurs during Phase II. Special procedures may be needed to localize seizure origin or to identify regions of normal or abnormal brain function. If warranted, surgical intervention occurs during Phase III, followed by appropriate post-operative treatment.

Phases of Intervention

Phase I Baseline evaluation for epilepsy surgery typically involves in-depth medical, radiologic, video EEG with seizure documentation, cognitive and psychological evaluation, audiological screening and speech-language evaluation. During Phase I, extensive monitoring is performed to determine the precise origin of seizure activity via continuous scalp EEG monitoring. Evaluation of previous pharmacotherapy assists in determining the therapeutic effects of present drug treatment or the viability of alternative regimens. A number of patients may be rejected as candidates for surgery on the basis of pharmacological history, i.e., inappropriate drug regimens.

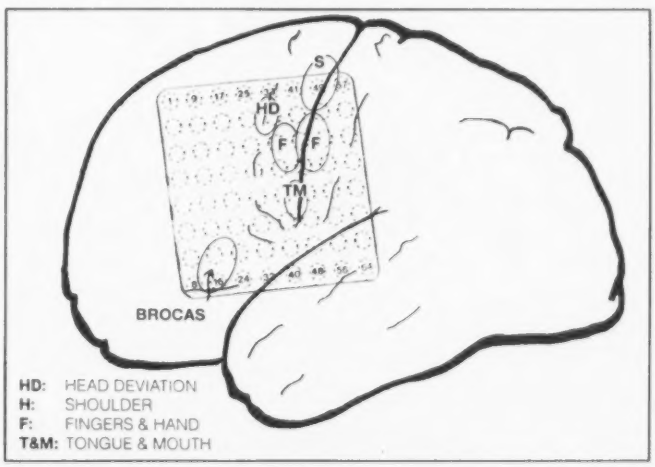
During Phase I, many professionals are actively involved in evaluating the patient. Radiographic evaluation is performed through neuroimaging studies. Psychological evaluation focuses on the patient and family to assess the impact of the seizures on the patient's cognitive, social and academic development. A neuropsy-chological evaluation is performed for patients six years and older to determine patterns of cognitive performance that may help to localize regions of brain dysfunction and to assess the effect of seizure activity on mental abilities.

Subsequent to hearing screening and full audiometric evaluation when warranted, the comprehensive speech and language evaluation is conducted (Appendix A). Dichotic listening testing may be administered also by the audiologist, particularly when patients are being considered for temporal lobectomy. Results from the dichotic listening tasks may be useful in lateralizing functional pathology and cerebral dominance. When Phase I procedures have been completed, the team convenes to discuss results and determine whether the patient will proceed to Phase II.

Phase II During Phase II, invasive EEG recording may be required when more precise definition of seizure origin is required. Subdural electrode monitoring is used to monitor cortical seizure foci and to stimulate brain regions of functional interest to create a "map". This procedure assists the neurosurgeon in avoiding, when possible, disturbance of speech and motor brain centers, such as Broca's area or the primary motor cortex. Invasive studies are useful also for excluding patients with multiple seizure foci where seizures are likely to persist after focal resection (Duchowny, 1989).

Phase III Phase III involves surgical excision of the epileptogenic areas and post-surgical stabilization of the patient with antiepileptic agents. Speech and language intervention occurs during this phase also. Baseline speech and language behaviors are compared to post-surgical findings and therapeutic interventions, such as developing word retrieval and memory strategies, are emphasized. Augmentative communication devices may be indicated for some patients, such as those who are post-callostomy and who may exhibit transient mutism (Sussman, Gur, Gur & O'Connor, 1983). Assistance

Figure 1. Functional Cortical Mapping



A subdural electrode grid is surgically implanted to define precisely the seizure origin or when seizures arise from functionally important anatomic brain regions. A map is created by stimulating electrodes on the grid with incremental current ranging from 2 milliamps to a maximum of 15 milliamps to the point where either the patient responds via motor signs, sensory symptoms or to the point where after-discharges are produced on the EEG.

in discharge planning is provided and, when necessary, prescriptive recommendations and appropriate referral sources are arranged.

Summary

The Speech-Language Pathologist's participation on the CEC team serves two principal purposes. The primary role is that of evaluating the patient's communicative status pre-surgically to determine what, if any, deficits are present in specific speech or language competencies or in the area of general cognitive-linguistic processing. This baseline information is shared with professionals on the team to assist in formulating a complete profile of the patient's status with regard to medical/surgical management. Equally important, is the Speech-Language Pathologist's role of providing patients with communicatively appropriate follow-up through direct intervention or recommendations for follow-up treatment in their home community.

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Prevey, M. L., Delaney, R. C. & Mattson, R. H. (1988). Gist recall in temporal lobe seizure patients (A study of adaptive memory skills). Cortex, 24, 301-312.

Spencer, D. D. & Spencer, S. S. (1985). Surgery for epilepsy. Neurologic Clinics, 3, 313-330.

Sussman, N. M., Gur, R. C., Gur, R. E. & O'Connor, M. J. (1983). Mutism as a consequence of callosotomy. Journal of Neurosurgery, 59, 514-519.

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Acknowledgments

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Appendix A

TEST PROTOCOL FOR CEC PATIENTS 0 TO 5 YEARS OF AGE

Assessment of Speach Mechanism

Robbins, J.A. & Klee, T. (1977). Robbins-Klee Oral/Speech Motor Control Protocol. Journal of Speech and Hearing Disorders, 52, 271-277

Assessment of Receptive and Expressive Language

Rossetti, L. (1990). Rossetti Infant-Toddler Scales (RITS). East Moline, Illinois: Linguisystems, Inc.

Huer, M. (1983). Non-Speech Test For Receptive/Expressive Language (NST). Don Johnston Developmental Equipment, Inc.

Hedrick, D.L., Prather, E.M. & Tobin, A.R. (1975). Sequenced Inventory of Communication Development (SICD). Seattle, Washington: Washington Press.

Newcomer, P. (1982) Test of Language Development-Primary (TOLD-P), 1982. Austin, Texas: Pro-Ed.

Lexical Semantic Assessments

Dunn, L. M. & Dunn, L. M. (1981). Peabody Picture Vocabulary Test-Revised (PPVT-R). Circle Pines, Minnesota: American Guidance Service.

Gardner, M. (1990). Expressive One-Word Picture Vocabulary Test-R (EOWPVT). Novato, California: Academic Therapy.

Tyack, D. & Gottelsben, R. (1977). Language Sampling Analysis and Training. Palo Alto, California: Consulting Psychologists Press.

Assessment of Morphology and Syntax

Carrow Woolfolk, E. (1985). Test for Auditory Comprehension of Language-Revised (TACL-R). Allen, Texas: DLM.

Newcomer, P. (1982). Test of Language Development-Primary (TOLD-P). Austin, Texas: Pro-Ed.

Tyack, D. & Gottelsben, R. (1977). Language Sampling Analysis and Training. Palo Alto, California: Consulting Psychologists Press.

Hedrick, D.L., Prather, E.M. & Tobin, A.R. (1975). Sequenced Inventory of Communication Development (SICD). University of Seattle, Washington: Washington Press.

O'Hara Werner, E. & Dawson Kresheck, J. (1983). Structured Photographic Expressive Language Test-II (SPELT-II). Sandwich, Illinois: Janelle Publications, Inc.

Pragmatic Assessment

Rossetti, L. (1990). Rossetti Infant-Toddler Scales (RITS). East Moline, Illinois: Linguisystems, Inc.

Tyack, D. & Gottelsben, R. (1977). Language Sampling Analysis and Training. Palo Alto, California: Consulting Psychologists Press.

Shulman, B. (1985). Test of Pragmatic Skills (TOPS). Tucson, Arizona: Communication Skill Builders.

Wetherby, A. & Prizant, B. (1990). Communication and Symbolic Behavior Scales (CSBS). Chicago, Illinois: Riverside Publishing Co.

Sensorimotor/Symbolic Play Development

Branston, M. B. & DuBose, R. (1974). Branston and Du Bose Inner Language Scale (ILS). George Peabody College.

Rossetti, L. (1990). Rossetti Infant-Toddler Scales (RITS). East Moline, Illinois: Linguisystems, Inc.

Wetherby, A. & Prizant, B. (1990). Communication and Symbolic Behavior Scales (CSBS). Chicago, Illinois: Riverside Publishing Co.

Linguistic Processing

Gardner, M. (1985). Test of Auditory Processing Skills (TAPS). San Francisco, California: Children's Hospital of San Francisco Publishing Dept.

Assessment of Phonology

Pendergast, K., Dickey, S., Selmar, J. & Soder, A. (1967). Photo Articulation Test (PAT). Danville, Illinois: Interstate Printers and Publishers.

Hodson, B. (1986). Assessment of Phonological Processes-R (APP-R). Danville, Illinois: Interstate Printers and Publishers.

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Appendix B

TEST PROTOCOL FOR CEC PATIENTS 6 TO 21 YEARS OF AGE

Assessment of Speech Mechanism

Robbins, J.A. & Klee, T. (1977). Robbins-Klee Oral/Speech Motor Control Protocol. Journal of Speech and Hearing Disorders, 52, 271.

Dworkin, J. & Culatta, R. (1980). Dworkin-Culatta Oral Mechanism Examination (DCOME). Nicholasville, Kentucky: Edgewood Press, Inc.

Assessment of Receptive and Expressive Language

Newcomer, P. & Hammill, D. (1982).Test of Language Development Intermediate (TOLD-I). Austin, Texas: Pro-Ed.

Hammill, D., Brown, V., Larsen, S. & Wiederholt, J. (1987). Test of Adolescent Language (TOAL). Austin, Texas: Pro-Ed.

Carrow-Woolfolk, E. (1985). Test for Auditory Comprehension of Language-Revised (TACL-R). Allen, Texas: DLM.

Morgan, D. & Guilford, A. (1986). Adolescent Language Screening Test (ALST). Tulsa, Oklahoma: Modern Educational Corp.

Lexical Semantic Assessments

Dunn, L. M. and Dunn & L. M. (1981). Peabody Picture Vocabulary Test-Revised, (PPVT-R). Circle Pines, Minnesota: American Guidance Service.

Gardner, M. (1990). Expressive One-Word Picture Vocabulary Test (EOWPVT). Novato, California: Academic Therapy.

German, D. J. (1986). Test of Word Finding (TOWF). Allen, Texas: DLM.

German, D. J. (1988). Test of Adolescent Word Finding (TOAWF). Allen, Texas: DLM.

Tyack, D. & Gottelsben, R. (1977). Language Sampling Analysis and Training. Palo Alto, California: Consulting Psychologists Press.

Assessments of Morphology and Syntax

Tyack, D. & Gottelsben, R. (1977). Language Sampling Analysis and Training. Palo Alto, California: Consulting Psychologists Press.

Carrow W. E. (1985). Test for Auditory Comprehension of Language-Revised (TACL-R). Allen, Texas: DLM.

Hammill, D., Brown, V., Larsen, S. & Wiederholt, J. (1987). Test of Adolescent Language (TOAL). Austin, Texas: Pro-Ed.

O'Hara Werner, E. & Davson Kresheck, J. (1983). Structured Photographic Expressive Language Test-II (SPELT-II). Sandwich, Illinois: Janelle Publications, Inc.

Miller, J. & Yoder, D. Miller-Yoder Test of Grammatical Comprehension (MY). Baltimore, Maryland:University Park Press.

Pragmatic Assessments

Morgan, D. & Guilfford A. (1986). Adolescent Language Screening Test (ALST). Tulsa, Oklahoma: Modern Educational Corp.

Shulman, B. (1985). Test of Pragmatic Skills (TOPS). Tucson, Arizona: Communication Skill Builders.

Assessments of Articulation and Phonology

Pendergast, K., Dickey, S., Selmar, J. & Soder, A. (1967). Photo Articulation Test (PAT). Danville, Illinois: Interstate Printers and Publishers.

Hodson, B. (1886). Assessment of Phonological Processes-R (APP-R). Danville, Illinois: Interstate Printers and Publishers.

Linguistic Processing

McNeil, M. & Prescott, T. (1979). Revised Token Test (RTT)

Porch, B. Porch Index of Communicative Abilities in Children (PICAC). Palo Alto, California:Consulting Psychologists Press.

Semel, E., Wiig, E. & Secord, W. (1987). Clinical Evaluation of Language Functions-R (CELF-R). San Antonio, Texas: Psychological Corp.

Gardner, M. (1985). Test of Auditory Processing Skills (TAPS). San Francisco, California: Children's Hospital of San Francisco Publishing Dept.

Kirk, S.A., McCarthy, J.J. & Kirk, W.D. (1986). Illinois Test of Psycholinguistic Abilities (ITPA). Urbana, Illinois: University of Illinois Press.

Dollaghan, C., Campbell, T. & Tomlin, R. (1990). Video Narration Task (VNT), Journal of Speech and Hearing Disorders: 55, 582.

Assessments of Memory

Baker, H. & Leland, B. (1967). Detroit Tests of Learning Aptitude (selected subtests). Indianapolis, Indiana: Bobbs Merrill Co. Inc.

Gardner, M. (1985). Test of Auditory Processing Skills (TAPS). San Francisco, California: Children's Hospital of San Francisco Publishing Dept.

Semel, E. Wiig, E. & Secord, W., (1987). Clinical Evaluation of Language Functions-R (CELF-R). San Antonio, Texas: Psychological Corp.

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Speech Language Services for Children and Adolescents in Psychiatric Hospitals

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ABSTRACT

There is an increasing number of children and adolescents who require hospitalization for psychiatric treatment and also receive treatment for speech and language deficit or disorder. Speech-language pathologists employed within this setting must be familiar with psychiatric classification systems, terminology, treatment modalities and psychotropic medications. When children return to school settings, discharge information regarding treatment in the medical setting must be released to ensure continuity of speech/language treatment goals and objectives. The purpose of this paper is to provide an overview of areas that have been identified as pertinent for speech-language services in psychiatric inpatient programs and for transitioning to educational placements.

INTRODUCTION

A high incidence of speech and language disorders coexist in children who are diagnosed with psychiatric disorders (Baker & Cantwell, 1982; Baltaxe & Simmons 1988; Cantwell & Baker, 1985; Cantwell, Baker, & Mattison, 1981; Gualtieri, Koriath, Van Bourgondien, & Saleeby, 1983; Prizant, Audet, Burke, Hummel, Maher, & Theadore, 1990). Many children with a psychiatric diagnosis such as conduct disorder or mood disorder are unable to maintain control of their behaviors consistently enough to remain in a regular public school classroom. An increasing number of children and adolescents are requiring a more restrictive environment such as that found in a psychiatric hospital. The average lengths of stay for children admitted for psychiatric treatment are frequently extended. Evaluation of the speech and language skills of children who are admitted to psychiatric hospitals is important to identify speech or language disorders or deficits that can influence behavorial programming or comprehensive treatment plans. Children receiving psychiatric treatment may also receive speech-language (S/L) services concurrently. Speech-language pathologists who are employed in such hospitals or work with children having a psychiatric diagnosis must be knowledgeable of the terminology and treatment procedures that are used in psychiatric hospitals.

Information dissemination and transition to a regular classroom become more important, too. The purpose of this manuscript is to highlight current issues that speech-language pathologists face when working with emotionally disturbed children in psychiatric medical and educational settings.

Speech-Language Disorders in a Psychiatric Population

Cantwell, Baker, and Mattison (1981) described the prevalence and types of psychiatric and behavioral disorders identified in children with speech and language problems. Results of their landmark study of 200 children with communication disorders indicated that more than 50% of the children with S/L disorders who had been referred to a speech and hearing clinic should also have been referred for a psychiatric evaluation. In the past several years, results of descriptive studies have indicated a high incidence of communication disorders in children with psychiatric or behavioral disorders (Baker & Cantwell, 1987; Baltaxe & Simmons, 1990). Incidence data vary with the methodologies used in these studies. Some researchers examined occurrence of S/L disorders within treatment settings for psychiatric/behavioral disorders, whereas others have described occurrences of emotional problems with communication disorders (Baker & Cantwell, 1982). Although the relationship between psychiatric and communication disorders may be highly individual, it requires further investigation by speech-language pathologists (Prizant, Audet, Burke, Hummel, Maher, & Theadore, 1990).

Diagnostic Classification System And Terminology

In the State of Florida, speech-language pathologists who are working in schools frequently see children who are classified educationally as "Emotionally Handicapped," (EH) or "Severely Emotionally Disturbed" (SED). Such classifications are based on the results of psychological testing including formal standardized testing, behavioral rating scales, and observations of academic failure that can not be attributed to cognitive impairment.

Diagnoses of children who are admitted to psychiatric treatment centers or evaluated by psychiatrists as outpatients are based on the Diagnostic and Statistical Manual of Mental Disorders-III-Revised (DSM-III-R) (1987). A multi-axial system that has been developed over the past 40 years and continues to undergo periodic revision is used. The DSM-III-R multi-axial system includes five axes that refer to different classes of information. This information is in Table 1. Oftentimes the terminology used to describe characteristics of speech-language is unique. Such psychiatric terminology is in Table 2.

Psychotropic Medications

Psychopharmacology or the use of mediations as a form of treatment for emotional and behavioral disorders, is an intervention that impacts all members of the treatment team (Gadow 1986a, 1986b). Speech-language pathologists must become familiar with frequently used antipsychotic, antidepressant, and other psychotropic medication used in the treatment of subgroups having psychiatric illness. Antipsychotic, or neuroleptic

Table 1

DSM-III-R Multiaxial Diagnostic System

Axis I	Clinical Syndromes - Selected examples: Major Depression, Adjustment Disorder with Anxious Mood; Schizophrenia.
Axis II	Developmental Disorders - Selected examples: Mental Retardation, Pervasive Developmental Disorders, Specific Developmental Disorders. Personality Disorders - Selected examples: Antisocial Personality Disorder, Character Disorder.
Axis III	Physical Disorders and Conditions
Axis IV	Severity of Psychosocial Stressors - Specific stressors are noted and specified as either predominately acute events (duration < 6 months), or predominately enduring circumstances (duration > 6 months). Selected examples of stressors: death of a parent, change of school.
Axis V	Global Assessment of Functioning (GAF) - Overall judgement of a person's psychological, social, and occupational functioning on a hypothetical continuum of mental health-illness. Does not include impairment in functioning due to physical or environmental limitations.

Table 2

Psychiatric Terminology

Blocking: Pauses in speech occurring before a thought or idea has been completed. Typically, after blocking, the speaker will say either spontaneously or upon questioning that he cannot recall what he has been saying.

Clanging: A pattern of speech in which word choices are governed by sounds rather than by conceptual relationships; may include rhymes and puns.

Flight of Ideas: Rapid thought in a nearly continuous flow; includes abrupt topic changes usually based on understandable associations, work plays, or distracting stimuli.

Illogical Thinking: Refers to thinking in which conclusions are reached that are clearly false, given initial premises, and that contain clear internal contradictions; may be observed in the absence or the presence of delusional thinking.

Poverty of Speech: A restriction in the amount of speech manifested by brief unelaborated spontaneous speech and brief unelaborated replies to questions; or speech that is not restricted in quantity but conveys little new information because of frequent use of obscure phrases, stereotyped phrases, repetitions, or vagueness.

Pressure of Speech: Speech that is increased in amount, rapid in rate, and difficult to interpret.

medication may be prescribed to treat schizophrenia or other acute psychoses. Ritalin, a stimulant, has typically been the most frequently prescribed drug for hyperactivity. Lithium, an antimanic agent may be used for treatment of acute mania. In the past few years, it has been used with some success for reduction of aggressive behaviors displayed by emotionally disturbed children. Patients who suffer from acute depression are frequently treated with trycyclic antidepressants, such as amitriptyline (Elavil).

The speech-language pathologist who works in a psychiatric hospital should be knowledgeable of medication changes ordered by the attending physician. Knowledge of a client's current medication regimen and possible side-effects is important in speech-language evaluation and treatment. For example, the initiation of psychotropic medication may reduce a client's responsiveness in structured test situations. Evaluation of speech or language may be temporarily deferred until psychopharmacological treatment has been established and behaviors have stabilized.

Further, the speech-language pathologist should have some familiarity with movement disorders such as tardive dyskinesia that may result from prolonged use of psychotropic medication. Although specific effects of psychotropic medications on speech and language have not been described extensively (Gadow, 1986a), the speech-language pathologist can provide valuable feedback to the medical team regarding a client's performance in speech-language therapy when medication changes are made.

Delivery and Documentation of Speech-Language Services

If a child has received S/L therapy during treatment at a psychiatric hospital, each diagnostic and therapy session will be documented in the child's medical record. As in any medical setting, a continuous record of a patient's progress in S/L therapy exists, as well as reports from all other habilitative, or rehabilitative therapies. Information regarding treatment at a psychiatric hospital frequently remains in the hospital's medical record and may be unavailable to the speech-language pathologist who provides follow-up. Discontinuity in treatment can result from this lack of information exchange between the medical setting and educational placement.

Documentation Requirements

Hospital programs are typically reviewed by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). Standards of care for Speech-Language Pathology and Audiology Services are listed in the Accreditation Manual for Hospitals (AMH). Residential treatment facilities are also reviewed by JCAHO and these standards are listed in the Consolidated Standards Manual (CSM). The standards for speech-language pathology and audiology services in both settings are similar with primary differences in the requirements for screenings. Hospital standards indicate that speech-language pathology and/or audiology services provide for a continuum of services from screenings through evaluation and discharge. The standards for Rehabilitation Services (CSM) specifically require hearing screenings for new patients who have not been screened previously. Both AMH and CSM standards require speech, language, or hearing evaluations when indicated.

Hospital (AMH) standards are more detailed in regard to the areas that must be included in evaluations. Additionally,

the AMH standards include a specific requirement for discharge planning to assist patients in understanding their communication abilities and prognosis. Since psychiatric services are not specifically targeted by JCAHO standards, the frequency of evaluation and progress notes may be based on the guidelines established by the American Psychiatric Association (APA). Table 3 includes a delineation of the areas of S/L information that are most likely to be included in a medical chart.

Table 3

Suggested Sources for S/L Information from Hospitals

Progress Notes - May be daily, weekly, and/or monthly

Treatment Plans - "Master" or "Comprehensive"

Speech and Language Screening Results

*Hearing Screening Results

Evaluation Reports

Test Protocol Forms

*Quarterly Reports

*Annual Reviews

Assessment of Involuntary Motor Symptoms (AIMS)

Discharge Summaries

Note: *These documents should be available from facilities that are accredited by the Joint Commission on Accreditation of Healthcare Organization and reviewed for Residential Treatment standards (CSM).

Identifying Speech-Language Information in Hospital Records

Records of patients who have a history of prior hospitalizations often have discontinuity in documentation of S/L diagnostic and therapy services. The information that is most frequently present at admission is that which is pertinent to the psychiatric hospitalization or residential treatment. This documentation typically includes psychiatric, neurological, psychological, medical (physical) and/or neuropsychological assessments. Speech, language, and hearing functioning may be mentioned in any of these reports. However, unless deficits in these areas have been a major focus of hospital treatment, reports of S/L or audiological services are not typically transferred to educational personnel. The S/L therapy plans for patients in psychiatric hospitals are usually developed as components of a team treatment plan. The initial treatment plan is developed within 72 hours of the child's admission to the facility and specifies the presenting problems that have resulted in hospitalization. The treatment team conducts an evaluation process and identifies ancillary or contributing problem areas such as educational deficits or learning disabilities. If a patient has been identified as a candidate for S/L services, speech-language goals and objectives will be included in the "Master," or "Comprehensive" Treatment Plan.

Requesting Medical Records

The medical chart contains many documents that are protected by law to maintain confidentiality. A Release of Information Form must be completed before copies of any documents may be released. This Release of Information Form must indicate which documents are to be released, to whom they may be released, and the name of the person or agency that is making the request. Records release forms for treatment of children must be signed and dated by a parent, or legal guardian. The records release form may be obtained by contacting the Medical Records Department of the psychiatric hospital.

A standard list of information/documents that relate to S/L services may be included in the packet of information that is routinely requested by education staffing specialists for transition from hospitals to schools. Speech-language pathologists should initiate the request for S/L therapy progress notes to ensure continuity of services. With the increasing incidence of children who are hospitalized for psychiatric treatment, development of a procedure for obtaining records of S/L therapy will increase long range time-efficiency for the speech-language pathologist. The attainment of S/L records may be a lengthy and somewhat time consuming process, yet the end result is worth the effort.

Transforming Medical Information Into Educational Objectives

The quality of the Individual Educational Plan (IEP) depends heavily upon the information that has been requested prior to the education placement meeting. If a Comprehensive Treatment Plan is received from a child's psychiatric hospital record, the S/L section of the plan should include therapy goals and objectives that are listed in a chronological format. Since hospital treatment plans are typically reviewed monthly, the short-term objectives are designed to be met in thirty days. Hospital standards do not require that S/L plans contain projected therapy objectives for one-year periods, as is the requirement for IEPs. Nonetheless, documents received regarding psychiatric hospital treatment provide important information for the development of S/L IEP goals and objectives.

These documents should be reviewed to identify:

- Strengths and weaknesses related to speech, language, behavior, and/or overall educational performance;
- The rate of progress that the patient/student has demonstrated (to project annual IEP objectives);
- Patterns of change in speech or language related to emotional/behavioral characteristics; episodic patterns may be identified in reviewing therapy progress notes;
- Patterns of change in speech or language related to pharmacological therapy (medications); records of the Abnormal Involuntary Movement Scale (AIMS) may include notation of alterations in speech or language behaviors when medications have been adjusted for therapeutic ranges; and
- Speech or language skills that warrant continued therapy for maintenance or generalization.

Conclusion

A high incidence of speech-language disorders has been identified in children with psychiatric diagnoses. As a consequence of increased length of hospitalization S/L services for this patient population have increased. Speech-language pathologists need to have knowledge of psychiatric diagnoses, psychotropic medications, and psychological treatment procedures. Accurate and frequent documentation of S/L services is required in this medical model of service delivery. These documents are contained within the patients' medical charts and are available if the correct procedures for requesting medical records are followed. They

provide integral information for the development of IEP goals and objectives and increase the continuity of services after discharge from a hospital. Speech-language pathologists are challenged to expand their knowledge base so that S/L services augment and enhance the psychiatric treatment of emotional/behavioral disordered children.

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